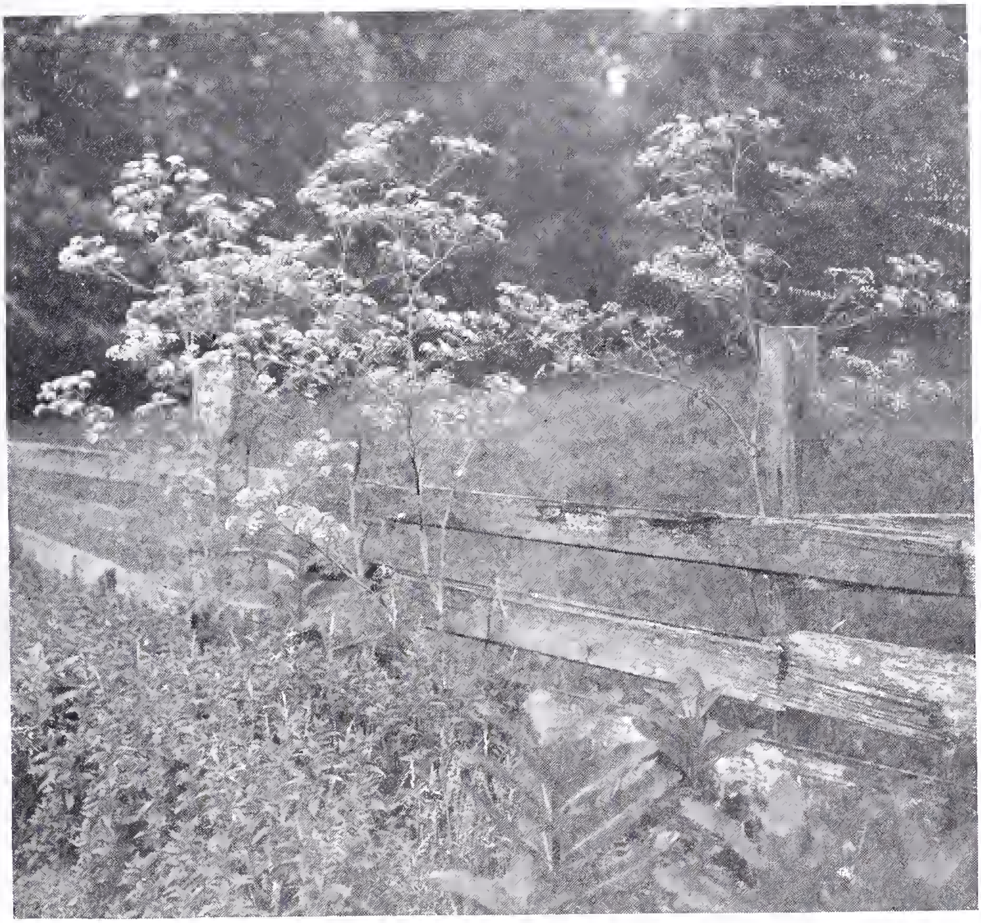
BULLETIN, PENNSYLVANIA DEPARTMENT OF AGRICULTURE
VOLUME 18, NUMBER 5, AUGUST 1, 1935

POISONOUS PLANTS
OF PENNSYLVANIA



Poison Hemlock (*Conium maculatum*)

GENERAL
BULLETIN
No. 531

HARRISBURG PENNSYLVANIA

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Published bi-monthly by direction of the Secretary. Entered as second class matter, March 22, 1918, at the Post Office at Harrisburg, Pa., under the Act of June 6, 1900.

Poisonous Plants of Pennsylvania

By E. M. Gress, Ph.D.

That more information on the subject of poisonous plants is needed is fully realized by farmers and veterinarians. Although not ascertainable, the animal loss to farmers caused by livestock poisoning is no doubt enormous, and if known would be appalling. When the loss is ten or more registered cows or a horse, pony and three head of cattle within a few days as was the case with two farmers only a few years ago, the loss soon amounts to thousands of dollars.

In addition to the monetary loss of farm animals, there is scarcely a year that the death of human beings is not reported. People mistake mountain laurel for wintergreen; water hemlock for parsnips, sweet anise or artichokes; the fruit of moonseed vine for wild grapes, and make other mistakes with fatal results.

While the information on poisonous plants is still quite incomplete, much valuable information on many of the most poisonous plants with the symptoms produced on the animal eating such plants is now definitely known and available. Many farmers, veterinarians and other citizens are not acquainted with these poisonous plants and are unable to recognize them in the field, with the result that often the death of an animal is attributed in general to forage poisoning without knowing definitely the plant which caused the trouble.

A few years ago a farmer brought to the Botany Division of the Department of Agriculture twenty-five to thirty plants found in a pasture where several cattle and horses had died. The farmer suspected that some one of the plants had caused the trouble. Not one of the submitted plants was known to be poisonous but, on examination of the pasture, water hemlock was found to be abundant. It was young and partly hidden by the grass and consequently overlooked by the farmer and veterinarian. It was obvious that these plants were being eaten and the symptoms of the animals poisoned were definitely those of water hemlock poisoning. The swampy areas where the water hemlock was growing were shut off from the remainder of the pasture, and the trouble ceased immediately.

A large dairy farm in southeastern Pennsylvania had trouble with cows dropping off in their milk yield, some becoming entirely dry. Creeping buttercup which polluted the meadowland pasture to the extent of almost fifty percent, and which, without doubt, was causing the trouble was overlooked and not even suspected.

Neither the physician nor any one else in the neighborhood where the young man, a C.W.A. worker at Somerset, Pa., died a horrible death in March, 1934, recognized the roots which did the deadly work as those of water hemlock.

CONTRIBUTORY FACTORS

Numerous factors contribute to the poisoning of cattle. Among these are soil, climatic and seasonal conditions, scant pasturage, and the physical condition of the animal. In Tennessee the white snake-

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[1] Acknowledgments: Figs. 1, 2, 3, from photos by Dr. L. K. Overholts, State College, Pa.; Figs. 7, 14, 15, after Clark and Flecher, *Farm Weeds of Canada;* Figs. 28, 29, 31, after Beal. *Michigan Weeds;* Fig. 32, after Chestnut, *Thirty Poisonous Plants of the United States.*

root was found to be more toxic in one region than in other regions, thus indicating that soil conditions affect the toxicity of the plants. Sudan Grass is poisonous only when frosted, stunted in growth as by drought or when wilted. Water hemlock seems to be much more toxic when in a young tender stage than it is in bloom or when dry in hay.

Livestock will eat poisonous plants more readily when the pasturage is scant than when the forage plants are in a thrifty growing state. This is quite noticeable in late summer when cattle will eat the bracken fern in the absence of good pasture plants. Sometimes an unhealthy animal may nibble at plants that it would not touch if in the best physical condition. In this way a depraved appetite may be acquired for a poisonous plant. Such is often the case with the deadly Loco weed in western United States.

PREVENTION IMPORTANT

In many cases of plant poisoning, a remedy will not save an animal when given after the symptoms are first noticed. Therefore, prevention is very important. If it is known that poisonous plants are growing where livestock can get them, the plants should be eradicated. One of the most deadly poisonous plants is water hemlock which in mid-summer is quite conspicuous and can easily be pulled up by the roots when the ground is moist. The plants with the fleshy roots should be carefully removed and burned.

Wild black cherry, if allowed at all in the pasture, should be carefully guarded so that animals can not have access to broken off branches with wilted leaves, which contain Prussic Acid, a deadly poison. Black locust has poisoned horses which ate the bark from trees to which they were hitched.

A dairyman killed some cows by cutting Sudan Grass and throwing it into the pasture for the cattle. The hot sun and the trampling by the cattle caused it to develop prussic acid which quickly killed several valuable cows.

When the pasturage is scant and the drinking water is low and stagnant, the animals should be given additional forage before being turned into the pasture, and clean pure water should be available especially when the weather is hot and dry.

TREATMENT

When an animal becomes sick it is very difficult, indeed, often impossible, to determine the cause. If poisonous plants in the pasture are suspected not only the sick animals but the entire herd should be removed at once. Place the sick animals where they can not do any physical injury to themselves, and send for a veterinarian at once.

With the good roads, the automobile and the increased number of veterinarians as compared with some years ago, there is no region in the state where expert assistance can not be secured within an hour or two at most. Search the pasture and examine the feed for poisonous plants or materials. Do not resume using the suspected feed or return the animals to the pasture until the cause of the trouble is determined.

ERGOT

(Claviceps purpurea)

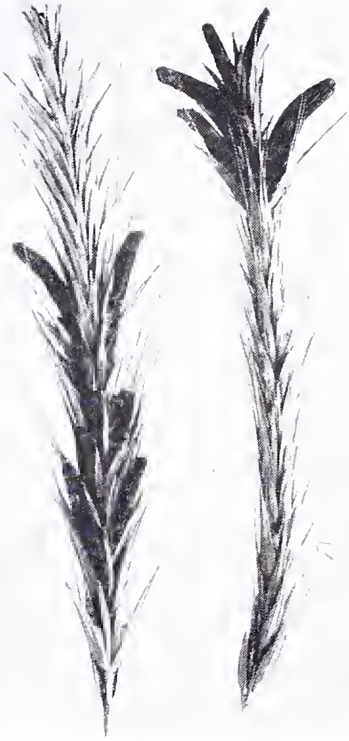

Fig. 1. Ergot on Rye

Ergot (Fig. 1) is a fungous disease of many native and cultivated grasses, perhaps most frequently found on rye. The disease is usually called ergotism and is caused by substances which act upon the nervous system. It causes convulsions, disintegration of the red corpuscles and it may produce inflammation of serous and mucous membranes. If taken in small amounts over a period of days there may be nausea, vomiting, colic and diarrhea or constipation. In the spasmodic type of the disease there are spasms, delirium, and pregnant animals usually abort. In the gangrenous type the small blood vessels are constricted which causes breaking down of tissues and a coldness and numbness of the extremities followed by dry gangrene, which may lead to the sloughing off of the feet, tips of the ears and tail and shedding of the hair and teeth. Death results from exhaustion.

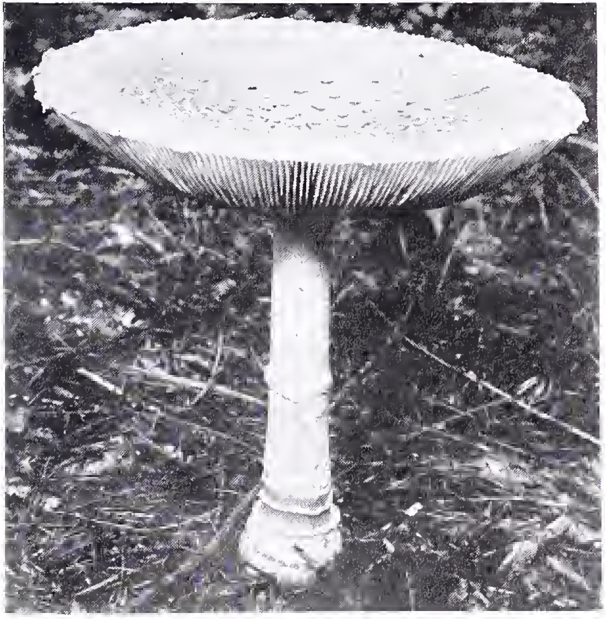

Fig. 2. Fly Amanita

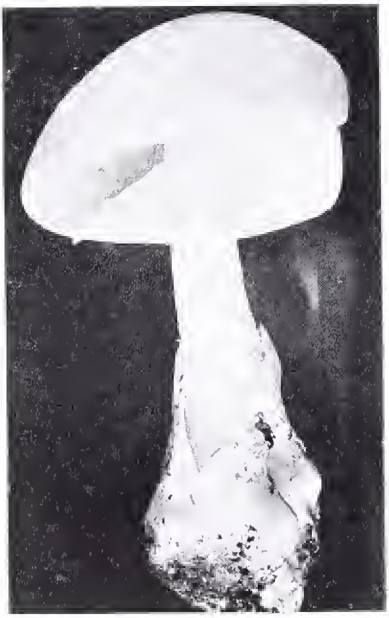

Fig. 3. Death Cup

FLY AMANITA *(Amanita muscaria)*
and
DEATH CUP *(Amanita phalloides)*

There is no sharp line of distinction between *Toadstools* and *Mushrooms.* In popular language the former is poisonous and the latter edible. Neither is there any popular rule or test by which the poisonous toadstool can be distinguished from the edible mushroom. The only rule to follow is: Never eat any mushroom unless you are *absolutely sure* that it is not poisonous. Take no chance whatever, for every year some one in Pennsylvania dies from mistaking a poisonous toadstool for an edible mushroom.

While livestock do not as a rule eat mushrooms of any kind, yet occasionally they develop a taste for them and do eat one of the poisonous kinds with fatal results.

The symptoms caused by Fly Amanita (Fig. 2) are salivation, vomiting, diarrhea, less rapid heart beat, very difficult breathing, after several hours profound stupor, often preceded by cold sweats and nervous actions, such as giddiness, double vision and lockjaw.

In Death Cup (Fig. 3) poisoning the bad symptoms begin from nine to fourteen hours after the poisonous toadstool has been eaten. They are severe abdominal pain, cramps in the legs, convulsions, weak pulse, nausea, vomiting, extreme diarrhoea, the discharges assuming the "rice water" condition characteristic of cholera. Generally the patient does not lose consciousness. If toadstool poisoning is suspected, get a physician as quickly as possible; for livestock send at once for a veterinarian.

For one who is not familiar with identifying mushrooms, a description is of little or no use, therefore the description of these two deadly toadstools is omitted.

BRACKEN FERN
(Pteridium latiusculum)

There is still some uncertainty regarding the poisonous properties of brake or bracken fern (Fig. 4). While some feeding experiments show negative results, the evidence generally seems to prove that it is poisonous.

A bulletin on the poisonous plants of Oregon makes the following statement: "Fern staggers is undoubtedly more common than any other trouble caused by poisonous plants in Western Oregon."

In the *Pennsylvania Farmer* issued November 10, 1934, the following on "Brake Fern Poisoning" is quoted: "Of the diseases caused by plants, bracken poisoning is perhaps the most prevalent in New York State, says Doctor W. M. Evans of the New York State Veterinary College. This disease is seen mostly in cattle and results from eating a certain type of fern, called the brake fern or bracken. This fern is especially common in run-down and woodland pastures. Under favorable conditions, cattle will not eat brakes, but if the season has been dry, or the pastures so overstocked that little natural forage exists, they often turn to ferns. If enough is eaten, death occurs from hemorrhage in the tissues."

W. A. Hagan and A. Zeissig of the New York State Veterinary College at Cornell University, Ithaca, New York, conducted some extensive feeding experiments on the bracken fern. Their report is given in *The Cornell Veterinarian,* Volume 17, No. 2, April, 1927. In the summary of that report the following statement is made: "The so-called 'undiagnosed disease' of cattle in New York State has been reproduced in all its essential features by feeding *Pteridium latiusculum,* the common brake fern, and is probably caused by that plant."

The "undiagnosed disease" referred to was a disease of cattle prevalent in New York State in 1919, which "in its clinical manifestation and post-mortem findings, greatly simulated anthrax and hemorrhagic septicemia."

Beginning in July or August when the hot weather is at its height and when the pastures are very low in good forage plants, reports of the loss of cattle come from the northern part of Pennsylvania. The symptoms are very similar to those of hemorrhagic septicemia but it does not yield to the preventive treatment of that disease. This seems to corroborate the findings of Hagan and Zeissig of Cornell and is sufficient evidence to throw heavy suspicion on bracken poisoning. In Pennsylvania, additional circumstantial evidence was obtained by always finding bracken fern in those pastures which were searched when the trouble was reported.

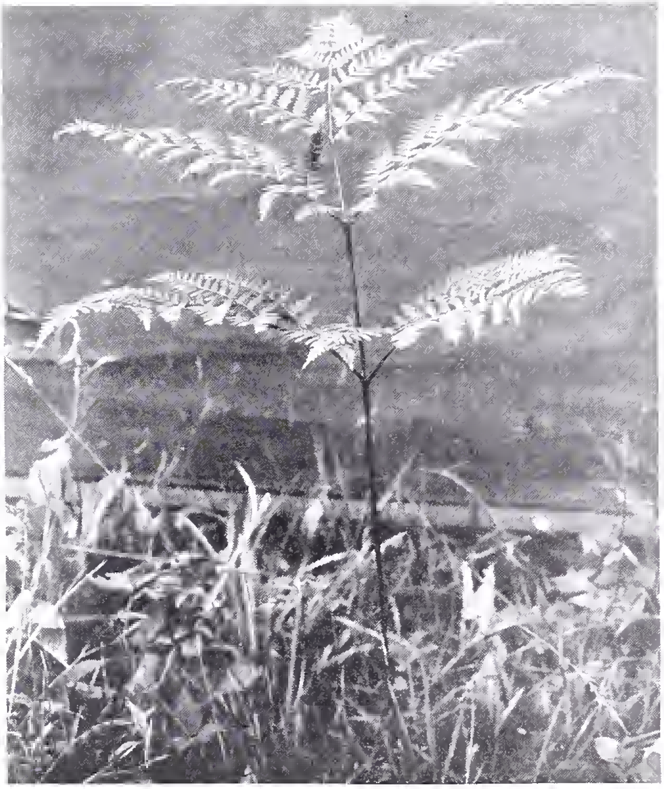

Fig. 4. Bracken Fern

A bull eight months old fed bracken fern by Hagan and Zeissig died after showing the following symptoms: "He stood with his head down, saliva drooling profusely from his mouth. A thin stream of bright red blood dripped from the left nostril. The pulse was 70, full but irregular, respirations 24, and temperature 107.1° F. The animal lay down and was induced to rise with difficulty. While lying down his breathing was sonorous; when he stood up, however, it was almost noiseless." Just before dying the breathing was dyspnoeic, inspiration being accompanied by a snoring sound.

A post-mortem showed large hemorrhages in musculature of the thoracic region, and on practically every organ.

In some poisonous plants the degree of toxicity varies with seasonal and ecological conditions. This may be true of bracken fern, which may account for the somewhat erratic results from feeding experiments and the uncertainty concerning the poisonous qualities of the plant.

Bracken fern is not usually eaten by livestock unless they are forced to do so by scant pasturage. Therefore, farmers and dairymen whose pastures contain this plant should take every precaution to prevent its being eaten. Daily supplemental feeding of other forage plants before turning the animals out to a run-down pasture containing bracken fern is a good preventive measure.

While bracken fern has a perennial root and is quite difficult to eradicate, nevertheless an effort should be made to eliminate it or to reduce it to a minimum in the pasture.

Description. The bracken fern is one of the most widely distributed plants. It is, indeed, almost cosmopolitan. Bracken is found in all sections of Pennsylvania and is especially abundant in the northern counties, from which come reports every year of trouble which may be due to this plant.

It may be distinguished from other ferns by the fact that the leafy part is divided into three distinct branches. The stem is usually brownish, sometimes quite black, and rather hard and stiff. On the under side of each small leaf-like division the edge folds over. Under this folded edge, the spores are developed. The spores do not begin to form before the latter part of July or first of August, which has suggested that the poison might be due to the abundant spores. There is no proof, however, of this.

HORSETAIL

(Equisetum arvense)

Notwithstanding the difference of opinion as to the poisoning of stock by equisetum (Fig. 5), there is a great deal of evidence from this country as well as from abroad to warrant care in feeding hay which contains the weed. Few, if any, reports from the eating of the green plant are recorded but there are many reports of poisoning from feeding hay contaminated with horsetail.

The following is quoted from *Some Poisonous Plants of Idaho* published by the University of Idaho Agricultural Experiment Station in 1916: "Young animals develop symptoms much more quickly and succumb to the equisetum poisoning sooner than the older ones. In one case under observation, a mare eating equisetum hay did not show symptoms until after four weeks, while her colt by her side developed typical symptoms of the poisoning and died in ten days. Nine out of fourteen horses on one farm, all fed alike upon good hay, were bedded with swale hay containing large quantities of this weed. They ate the bedding freely, and within three weeks all nine showed symptoms of poisoning; the remaining five bedded with straw kept perfectly well. The youngest, a three-year-old, was down and died a few days later. The oldest, an old brood mare, showed but slight symptoms, while the other seven, of intermediate ages, all staggered and reeled, although they recovered."

The symptoms of poisoning are quite definite. Among the first are unthriftiness, diarrhea and rapid loss of flesh. Excitement and anxiety are shown, followed by uncertainty of movement, reeling, staggering and paralysis of the hind limbs. Finally there appear general paralysis, unconsciousness and coma. The pulse is slow until near the end when it becomes rapid and weak. The temperature is below normal at first; later there is fever.

In very acute cases death may occur in a few hours but usually within a few days or a week. In chronic cases the animal may linger for several weeks. Horses, especially, may develop a depraved appetite for the weed and eat it in preference to good clean hay.

Professor Jones and Dr. Rich of the Vermont Experiment Station who had considerable experience in treating equisetosis recommend: first, to stop feeding hay which contains equisetum; then give a purgative of Barbadoes aloes, one ounce, one or two drams of ginger and sufficient soft soap to make a ball. Put the ball down the horse's throat at one dose, follow by bran mashes with copious draughts of

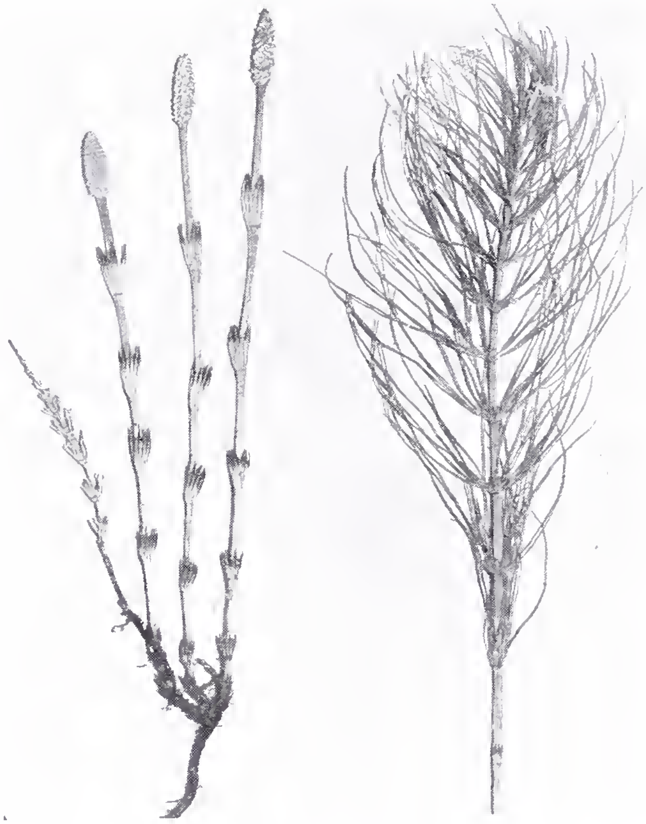

Fig. 5. Horsetail

tepid water. If aloes is not available, give a quart of raw linseed oil. After the digestive tract is cleared, give a teaspoonful of powdered nuxvomica three times daily to stimulate the animal and to overcome the muscular incoordination.

Description. In Pennsylvania the plant, which is quite common, is called horsetail, marestail or scouring rush. It is more closely related to ferns than to flowering plants, however it does not resemble a fern but looks more like a small pine tree. A cinder bank along the railroad is one of its favorite habitats. On the farm it is often abundant in sandy meadows along a stream. It has a perennial rootstock and, when once well established in a favorable habitat, it is very difficult to eradicate.

There are two forms of the plant. The one which produces the spores is unbranched and is terminated by a cone in which the spores are produced abundantly. These spores, which are microscopic, fall to the ground and produce new plants. This spore-producing plant makes its appearance very early in the spring before the other branching form is really visible. Later in the season the branching, sterile plant appears, which is the plant that causes the trouble in the pasture and hay. As is true of many poisonous plants, *Equisetum arvense* and a near relative *Equisetum hyemale* are listed among medicinal plants but should be used only as such on the advice of a physician.

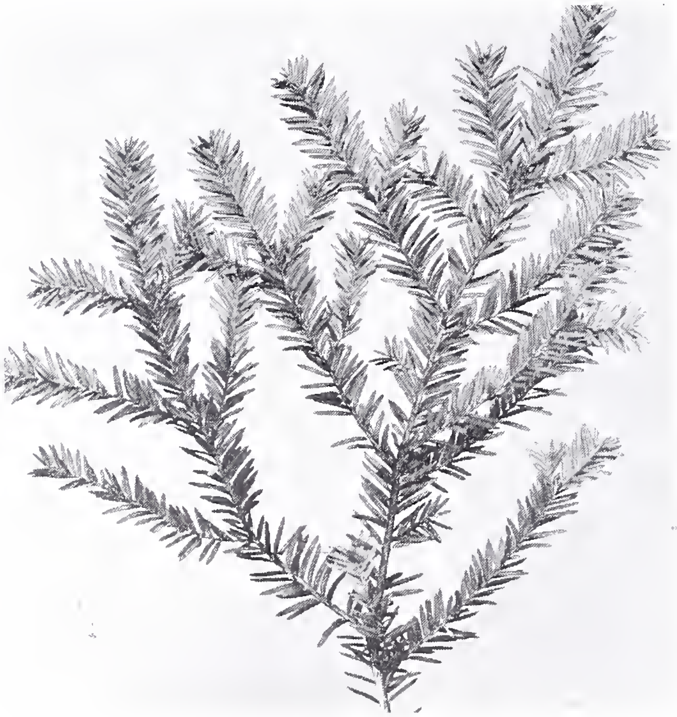

Fig. 6. Yew

YEW

(Taxus canadensis)

This plant (Fig. 6) is also called American yew and ground hemlock. It is found in shaded woods rather commonly in northern Pennsylvania. It is a low, spreading, evergreen shrub.

There are contradictory statements as to the results of eating the foliage, but there seems to be no doubt that it does cause poisoning. It may cause sudden death resembling apoplexy.

The symptoms, however, are slow, weak pulse, lowered temperature, gastro-enteritis and convulsion. Pregnant animals may abort.

The plant really needs no description. It resembles closely a young hemlock for which it is often mistaken. The leaves (needles) are green on both sides instead of being light colored on the under side like those of the hemlock. The yew also produces a red, berry-like fruit instead of the little pine-like cone of the hemlock.

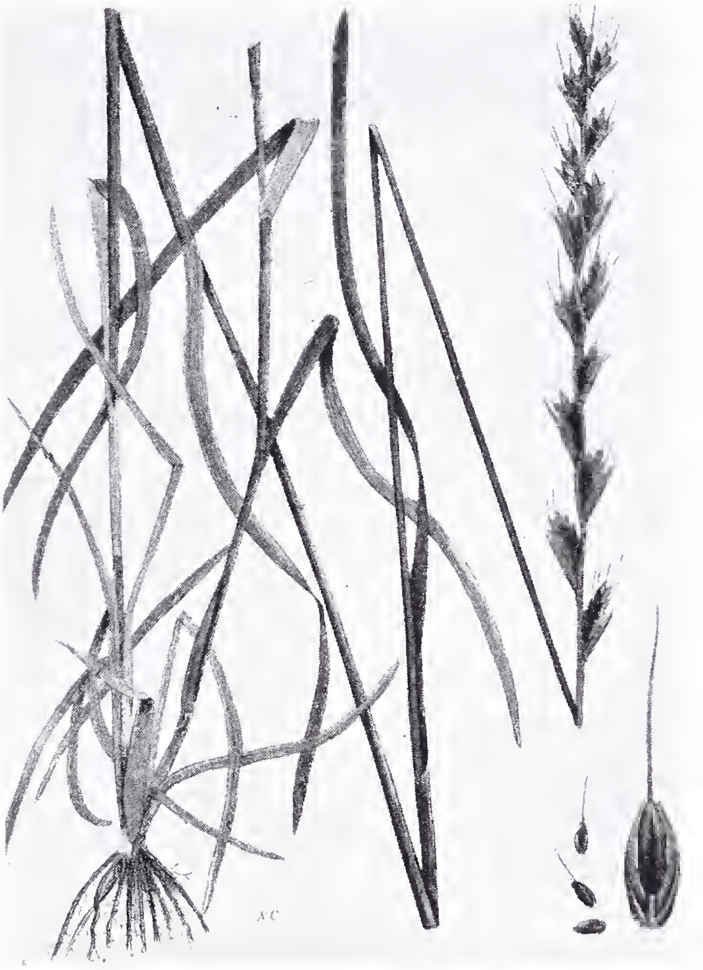

Fig. 7. Poison Darnel

POISON DARNEL

(Lolium temulentum)

Poison darnel (Fig. 7) was known among the ancients as a poisonous plant. It is thought to be the plant known in the Bible as tares. Shakespeare knew of its properties as is shown by the following lines (Henry VI, Act III, Scene 2): "Want ye corn for bread? I think the Duke of Burgundy will fast Before he'll buy again at such a rate: 'Twas full of darnel: Do you like the taste?"

There is some doubt as to the poisonous chemicals which it contains. There is no doubt, however, that the seeds are the parts which cause the trouble, due to the presence of a fungus. Poisoning may occur when the grains of darnel are not removed from cereals such as wheat, before being fed to animals or ground into flour for bread, the baking of which does not destroy the poison. Knowledge of this was known centuries ago, proof of which is found in the lines by Gerarde (1597): "The new bread wherein Darnel is, eaten hot, causeth drunkenness; in like manner doth beere or ale wherein the seede is fallen, or put into the mault."

Harold C. Long in his English publication entitled *Plants Poisonous to Live Stock* gives the following symptoms:—"Darnel poisoning induces giddiness, drowsiness, uncertain gait, and stupefaction, and, in older animals, vomiting, convulsions, loss of sensation and death. The symptoms in the horse are dilation of pupils, vertigo, uncertain gait, and trembling. The animal falls, the body is cold and the extremities are stiff, respiration is labored, the pulse is slow and small, and there are convulsive movements of the head and limbs. There is rapid enfeeblement, and death may occur within thirty hours. In pigs, foaming, convulsions and paralysis have been observed; the stomach and intestines were inflamed and the lungs congested."

Poison darnel is not a common plant in Pennsylvania, however, it is sometimes found in grain fields and waste places and it may cause more trouble than is actually known.

Description. Poison darnel is a grass which, in bloom and fruit, resembles a stalk of wheat or rye. The leaves are grass-like and the seeds form a spike which is often called a head. It is in flower in May and matures about a month later.

PRUSSIC ACID PRODUCING PLANTS

Hydrocyanic acid, more commonly called prussic acid, is a deadly poison which is produced, under certain conditions, by some wild and cultivated plants. Such plants are known as cyanogenetic. Among these plants the most dangerous in Pennsylvania are the following: Wild black cherry *(Prunus serotina)*, choke cherry *(Prunus virginiana)*, velvet grass *(Holcus lanatus)* and arrow grass *(Triglochin palustris)*, all of which are found wild; Sudan grass *(Holcus sorghum sudanensis)*, sorghum *(Sorghum vulgare)* and flax *(Linum usitatissimum)*, which are frequently found in cultivation, especially the Sudan grass.

Prussic acid is not found in any dangerous quantity in healthy growing plants. The acid develops when the normal growth of the plants is in some way retarded as by frost, drought, trampling, bruising, wilting or some other cause. The poison acid is formed by a chemical reaction between a glucoside and an enzyme contained in the plant. Neither of these two substances is in itself poisonous but when they are brought together a chemical reaction takes place by which the deadly poison is formed.

Ecological conditions are factors in the formation of prussic acid. Plants grown on poor soil contain less than when grown on good soil. Nitrate fertilizers seem to increase the amount of acid. Some plants grown in the south are less poisonous than when grown farther north. Plants that are very poisonous in a wilted state seem to have lost their poison when thoroughly dry. Prussic acid being volatile, no doubt, passes off into the air while the plant is drying. It will be noticed that many factors are involved, which makes it impossible to state any definite rule to determine when a cyanogenetic plant is poisonous.

Losses are often caused by carelessness on the part of farmers and dairymen. During the summer of 1934, one farmer lost about twenty head of hogs from prussic acid poisoning caused by Sudan grass. The hog lot had been planted to Sudan grass. In midsummer during a very hot, dry period about the time when the grass was in bloom, when the hogs had trampled the Sudan grass which, together with climatic conditions, caused much wilting, the animals became suddenly ill and died in a short time.

During the same summer a dairyman cut some Sudan grass and threw it into the pasture to supplement the forage for his cows when the pasturage was somewhat scant. Again the wilting and trampling made conditions right for the formation of prussic acid, with the result of a loss of several valuable cows.

Many losses occur in Pennsylvania from wild cherry poisoning. Both wild black cherry *(Prunus serotina)* and choke cherry *(Prunus virginiana)* are very common in the State. Often the branches are broken off by a severe wind storm or otherwise. The leaves of the broken-off branches soon wilt and cattle or other livestock are poisoned by eating these poisonous leaves.

Often a second crop of Sudan grass, producing a stunted growth or perhaps caught by an early frost, becomes poisonous causing loss to the unsuspecting farmer. Immature, frosted flax seed has been known to produce prussic acid poisoning. Indeed farmers should exercise every precaution when feeding forage plants which are known to develop prussic acid or when any of the wild plants are growing in the pasture where livestock can feed upon them.

No doubt in most cases of poisoning the prussic acid has been developed before the animal eats the plant but sometimes the acid develops in the stomach. Certain feeds retard or prevent this formation of the acid in the stomach. Among these are alfalfa hay, linseed cake, corn, milo, feterita, and other starchy feeds. Of course where there is any danger of prussic acid poisoning, no animal should be allowed to eat the suspected plants. However, it is well to remember that a previous feeding of the above mentioned feeds may act as a preventive against the poisoning.

The following symptoms of prussic acid poisoning are quoted from leaflet No. 88 entitled *Poisoning of Livestock by Plants That Produce Hydrocyanic Acid,* published by the United States Department of Agriculture, March 1932: "Hydrocyanic acid acts very quickly, frequently killing the animal within a few minutes, although sometimes the poisoned animal may live for several hours after the symptoms develop. There is first a brief period of stimulation followed by depression and paralysis. Symptoms of colic appear. Stupor, difficult breathing and frequent convulsions result from the action of the poison on the brain centers that control respiration. Death is caused by respiratory paralysis, the heart continuing to beat for some time after breathing has stopped."

As suggested previously, a veterinarian should be summoned as quickly as possible when poisoning is suspected. However, the following remedial treatment is quoted from leaflet No. 88 cited above: "No known chemical antidote to this poison can be relied on. Moreover, in the majority of cases hydrocyanic acid poisoning causes death so quickly that there is not time enough to apply remedial measures. Various preparations have been recommended as having possible beneficial results. As the use of drugs themselves is attended by some danger to an animal, a trained veterinarian should conduct or supervise the treatment.

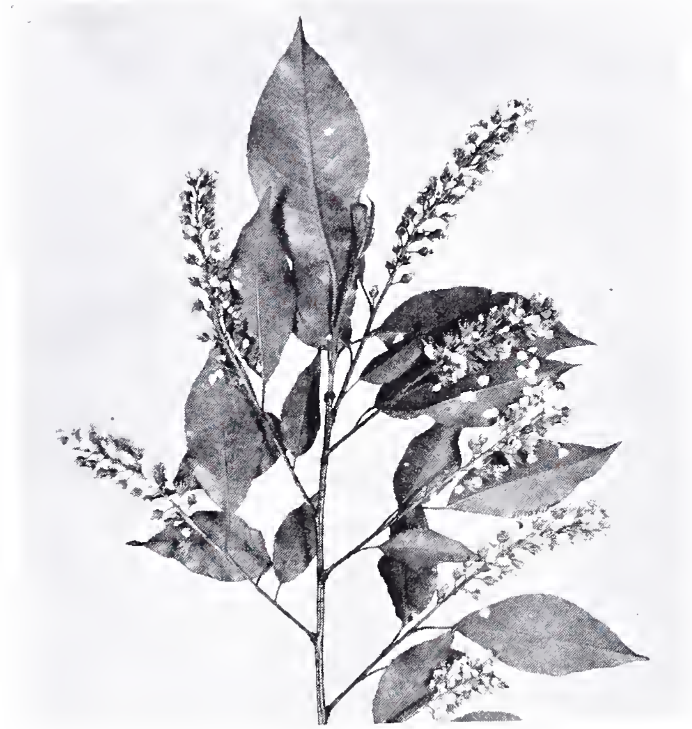

Fig. 8. Wild Black Cherry

"Oxidizing substances, such as potassium permanganate solution, given as a drench, destroy unabsorbed hydrocyanic acid in the stomach, and hydrogen peroxide slowly combines with the acid to produce a less dangerous substance. Glucose or ordinary corn sirup given as a drench combines with the acid to produce a harmless substance and, furthermore, retards the development of more hydrocyanic acid. A freshly prepared suspension of ferrous hydroxide in water, made by mixing equivalent quantities of copperas and caustic soda, converts hydrocyanic acid into relatively nonpoisonous substances (ferrocyanides) and so serves as an antidote. Remedies to be given by mouth, however, are generally unsuccessful after symptoms develop because by that time sufficient poison has been absorbed into the blood to produce death in most cases.

"The fumes of ammonia breathed into the lungs may be effective both through their strong stimulating action and through the tendency of ammonia to convert the acid into less dangerous substances.

Hypodermic injections of glucose, atropine, sodium sulphide, and sodium thiosulphate may be helpful if administered promptly."

WILD BLACK CHERRY

(Prunus serotina)

The wild black cherry (Fig. 8) is so well known that a description is hardly necessary. It is a tree which may attain a height of nearly a hundred feet with a trunk diameter of nearly four feet, but usually it is very much smaller. Indeed it is often found as a shrub with the choke cherry *(Prunus virginiana)* along fence rows and other waste places.

The alternate, ovate, sharp-pointed leaves are finely serrate. The small, white flowers are in a cylindrical cluster. The familiar fruit is a true cherry about a third of an inch in diameter, with a sweet but slightly astringent taste.

The wood of wild cherry is very valuable for cabinet work, but in addition to its being poisonous, the tree is a harbor for the injurious insect known to everybody as the tent caterpillar. Often in summer the wild cherry is literally covered and defoliated by this insect. No doubt, it would be an advantage to the farmer to replace the wild cherry on his farm with some more valuable tree that will not poison his livestock nor harbor injurious insects.

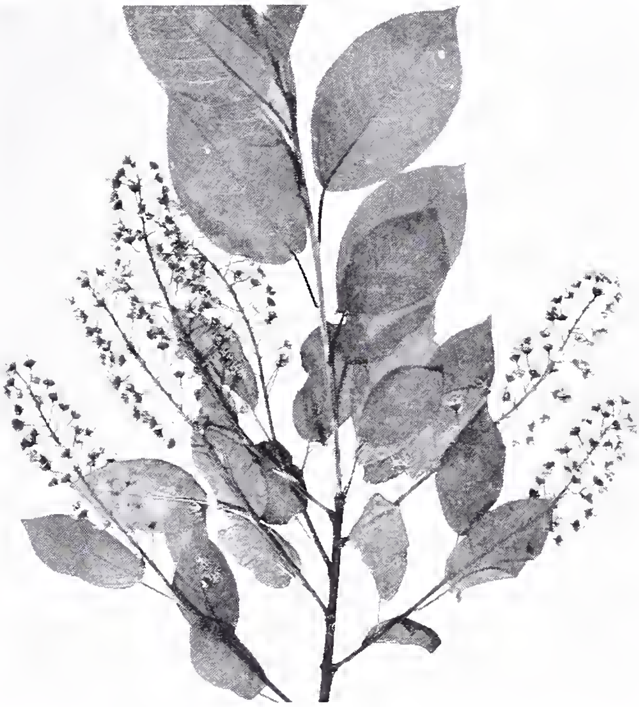

Fig. 9. Choke Cherry

CHOKE CHERRY

(Prunus virginiana)

The choke cherry (Fig. 9) is similar to the wild black cherry except that it scarcely, if ever, attains tree size. Ordinarily it is a shrub from two to ten feet tall. The leaves of the choke cherry are somewhat obovate, that is, they are widest above the middle while those of the wild black cherry are widest a little below the middle and taper rather uniformly toward both ends. The flower clusters are similar but the fruit is generally somewhat red, at least not quite so dark in color as that of the wild black cherry.

It has been stated that the choke cherry is less poisonous than the wild black cherry, but it must be looked upon with suspicion, and it would be better to have it eradicated from pastures.

VELVET GRASS

(Holcus lanatus)

The amount of poisoning from velvet grass (Fig. 10) is indeterminable. So far as known, no specific cases have been reported, although the plant is quite common in many meadow pastures in Pennsylvania. The plant is confined mainly to moist meadow land. The chief mark of identification is its almost white color and velvety feeling. Velvet grass grows in bunches and stands out very distinctly among other grasses, especially about the time it is in bloom. It is considered a forage grass in some places. Because of its possibility of causing prussic acid poisoning and of its little value as a forage grass, it would be better to consider it a weed to be eradicated.

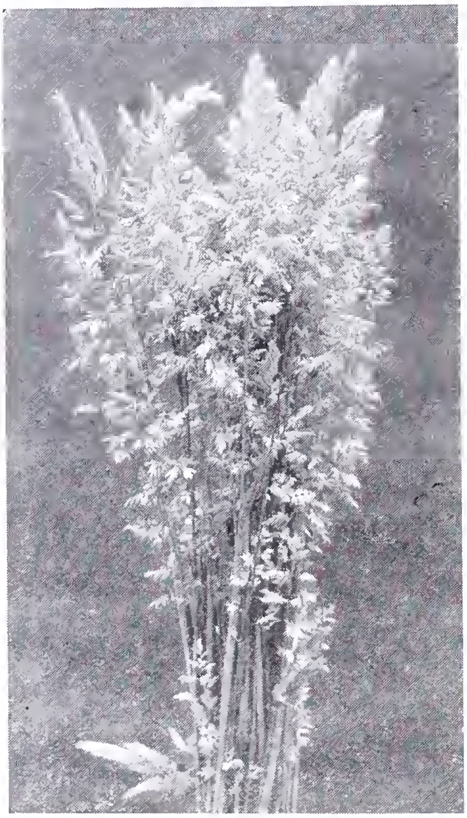

Fig. 10. Velvet Grass

SUDAN GRASS

(Holcus sorghum sudanensis)

Sudan grass needs no description. Its cultivation based on merits as a forage plant is increasing in Pennsylvania. Bulletin No. 277, published by the University of California Press, Berkeley, California, says of Sudan grass that it is good to look at, easy to grow and handle, grows during the summer, gives large yields and is well liked by stock.

As stated elsewhere, it seems to develop more poison in colder temperatures; therefore, the Pennsylvania grower should be cautious about using it under unfavorable conditions, such as wilting, stunted growth and frosting.

JACK-IN-THE-PULPIT

(Arisaema triphyllum)

Jack-in-the-pulpit is a woodland plant which seldom, if ever, causes loss of livestock or proves fatal to human beings.

The biting and stinging sensation caused by chewing a piece of the bulb as small as a pin head is well-known to most people. This burning is caused by crystals of oxalate of lime which is poisonous, and, if the bulb were eaten raw, it would cause serious, if not fatal sickness. Thorough boiling and baking dissolve the poisonous crystals and render the bulbs edible. The Indians knew this and thereby made the bulbs useful as food; hence the name "Indian Turnip." Cattle, sheep, goats and swine are susceptible to the poison, but seldom eat sufficient to cause much, if any, trouble.

The symptoms are intense burning and biting of the mucous membrane of mouth, throat and stomach, and in large doses it may cause gastro-enteritis. One should remember that vinegar will dissolve the crystals of oxalate of lime and stop the burning.

The plant is so well known that no description for identification is necessary.

FLY POISON

(Amianthimum muscaetoxicum)

So far as is known, no case of poisoning by this plant in Pennsylvania is on record. In 1911 a suspected case of poisoning of cattle was reported from Wilmington, North Carolina. Feeding experiments confirmed the belief that the plant contained poisonous properties.

Fly poison (Fig. 11) is not a common plant throughout Pennsylvania, although in certain sections in the Eastern part of the State a considerable quantity of the plant may be found.

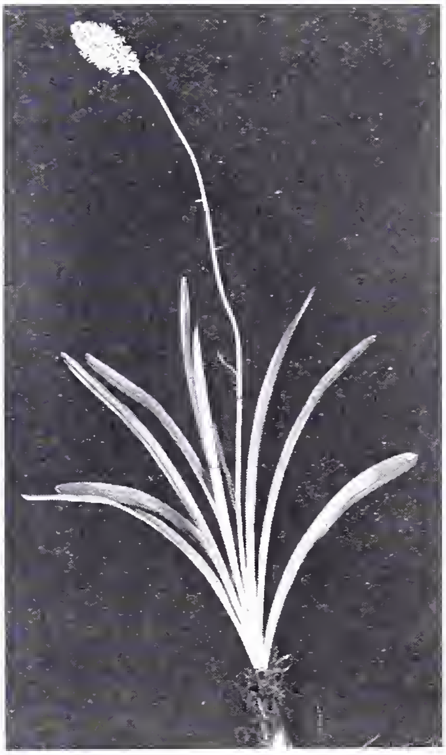

Fig. 11. Fly Poison

Description. Fly poison is very distinct and is not likely to be confused with any other plant. It grows only in the woods or among the shrubby growth of a cleared area. It springs from a bulb. The leaves are in a cluster near the ground. They may attain a length of more than a foot but are only about an inch wide. The stem which is from one to two feet tall has only small scale-like leaves. The cluster of white flowers is from two to five inches long and about one and one-half inches in diameter.

AMERICAN FALSE HELLEBORE

(Veratrum viride)

On April 18, 1933, a letter containing the following paragraph was sent to the Pennsylvania Department of Agriculture:

"The greens enclosed were given to a flock of forty chickens by accident. Within three hours the whole flock was sick and refused to eat. Eight of the hens were affected badly and at the time of writing this letter one is dead." The plant enclosed was American False Hellebore.

V. K. Chestnut in Farmers Bulletin, No. 86 of the U. S. Department of Agriculture states: "The seeds have been specially mentioned as poisonous to chickens. Some animals, such as the horse, are poisoned by eating the leaves, but animals, such as the sheep and elk, which chew the cud, seem to relish the plant, and eat it with apparent impunity. The root has been eaten with fatal results by human individuals. One instance is recorded where all of the members of a household were poisoned by eating the young leaves, which were mistaken for those of marsh marigold and prepared for food.

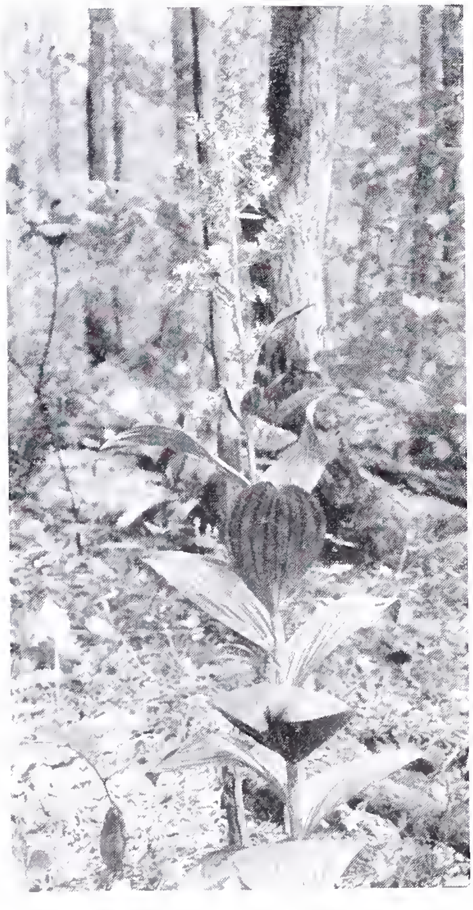

Fig. 12. Hellebore

"The poison operates chiefly against the action of the heart and spinal cord, both of which it tends to paralyze. It has also a violent, although somewhat tardy, emetic and cathartic effect, a property which is often effective in expelling the poison from the system before it accomplishes its deadly work."

The symptoms given by Chestnut are: "Burning in the throat, an increased flow of saliva, defective vision, vomiting, diarrhea, severe headache, dizziness, weak pulse, labored breathing, and profound prostration. Death is caused by paralysis of the heart."

Description. The plant (Fig. 12) is known locally by many different names. Among these names are—white hellebore, false hellebore, swamp hellebore, Indian poke, meadow poke, poke root, puppet root, earth gall, crow poison and itch weed.

It is a stout perennial plant, from two to eight feet high, with a fleshy root and large leaves which sometimes become nearly a foot long and six inches wide. The flower cluster on large plants may be two feet long and much branched. When in bloom it has a yellowish green color. It grows in swampy places and may be mistaken in early spring for skunk cabbage. A little later, however, the two plants are very distinct, resembling each other only in their large leaves.

POKEWEED

(Phytolacca decandra)

Some part of the plant (Fig. 13) has been used in many households. In early spring the young shoots are used like asparagus for food. The root and the alcoholic extract of the berries are quite often used for itch and other skin diseases, also for rheumatism.

Medicinally the plant should be used only on the advice of a physician. As a food it should be used with extreme caution, if at all. In gathering the young shoots for food, care must be taken not to get part of the roots which are very poisonous. Furthermore, the water in which the shoots are first boiled should be rejected because of the poisons which it may contain. Since children have been poisoned by eating the berries they should never be used for food.

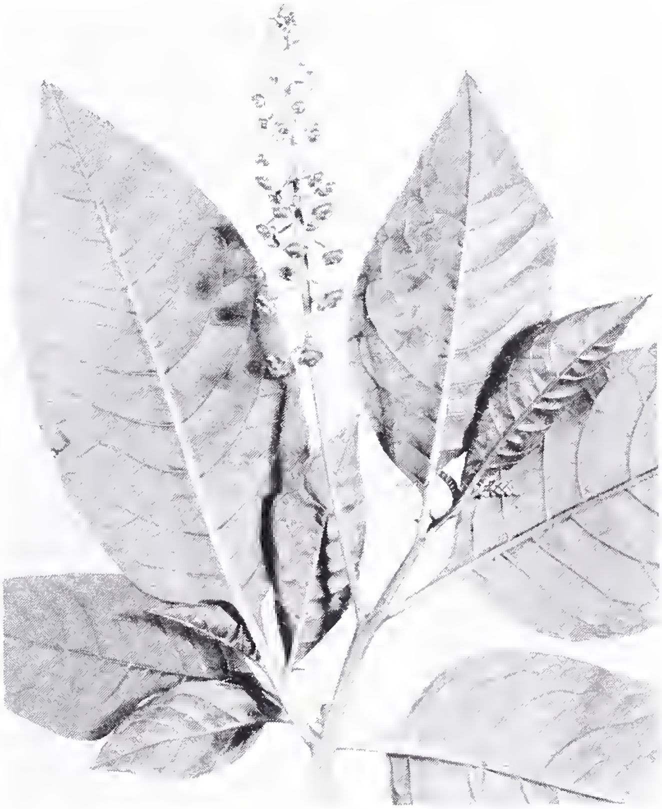

Fig. 13. Pokeweed

Perhaps most cases of poisoning by pokeweed have occurred by eating the roots in mistake for horse-radish, artichoke or parsnips.

The symptoms of poisoning by this plant are vomiting, purging, retching and sometimes severe convulsions. Death is apparently due to paralysis of the organs of respiration.

Description. Pokeweed is known by many different common names. Among these are—poke, poke-root, crowberry, cancer root, jalap, skoke, red-ink plant, and garget.

The plant is a rank-growing perennial, much branched and from five to ten feet tall. The root is thick and rather woody. The stem is often purplish, with large alternate leaves. The greenish-white flowers are in elongated clusters, followed in autumn with purplish-black berries which resemble an elongated bunch of wild grapes. It is quite common in Pennsylvania and is especially found in waste places, along the roadsides and in clearings.

COCKLE

(Agrostemma githago)

Corn cockle (Fig. 14) or more frequently among the farmers called cockle, is a very well known weed whose seeds may be the cause of a discount on the price of wheat. However, by very few is it known to be poisonous.

Poisoning very rarely, if at all, is caused by the growing plant, due perhaps to the fact that nothing will eat it. The black cockle seeds are often found in wheat from which they are separated with some difficulty. When the seeds are screened from the wheat, the screenings are often fed to poultry with fatal results. If too many seeds are ground with the wheat, they give to the flour a bitter taste and poisonous properties. The baking of the bread may not decompose the poison, therefore poisoning with sometimes fatal results has been reported from the eating of such bread. Calves and other animals are sometimes poisoned from eating the bran made from wheat in which cockle seeds are present; and if sufficient quantity is present, fatal results may follow. If small quantities are eaten regularly, chronic effect may be produced in both animals and human beings. This chronic form of disease is known as "githagism."

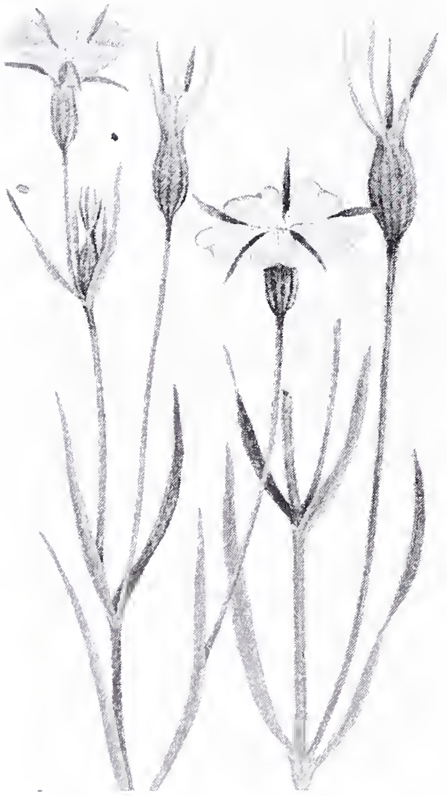

Fig. 14. Cockle

Description. Cockle is an annual plant which is propagated only by seeds. It is commonly found in wheat fields. The plant is one to three feet tall, erect, usually branched toward the top and covered with whitish, appressed hairs. The leaves are opposite, two to four inches long, rather narrow and softly hairy. The flowers form on the end of the branches. They are from one to two inches broad, with five spreading, reddish-purple petals, which are notched at the end and dark-spotted near the base. The calyx lobes are long and slender and extend beyond the petals. The capsule contains from twenty-five to forty black or very dark brown seeds.

BUTTERCUPS

(Ranunculus spp.)

There are several species of buttercups (Fig. 15) which cause poisoning, perhaps none of them is very serious in Pennsylvania.

The celery-leaved buttercup or crowfoot *(Ranunculus sceleratus)* is usually listed as poisonous, but so far as is known all of the Pennsylvania species contain the acrid, bitter juice which may cause trouble, especially if found in abundance as they sometimes are in pastures which have not been alternated with other crops for a number of years.

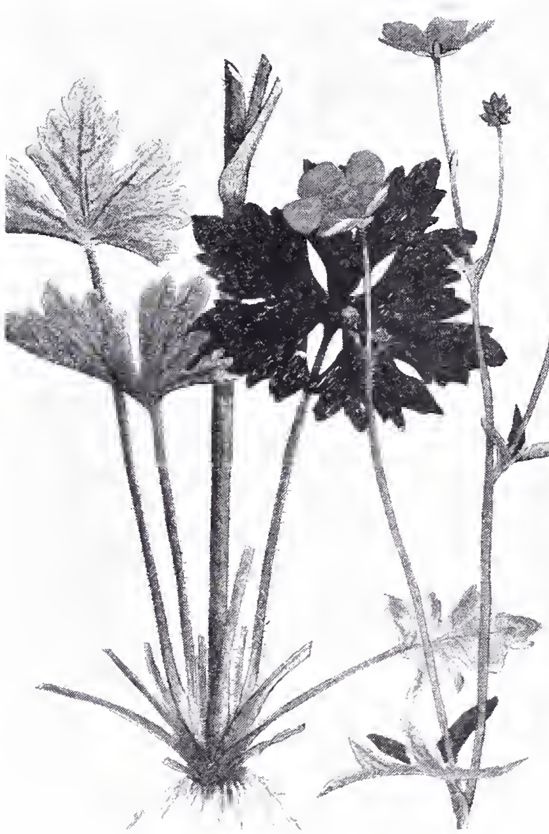

Fig. 15. Tall Buttercup

The symptoms given by Cornevin are:—"Gastro-enteritis, colic, diarrhea with excretion of black foul-smelling feces, vomiting when possible, falling-off in milk yield in cows, nervous symptoms, reduction in pulse, and stertorious respiration, dilation of the pupils, enfeebled condition. difficult mastication, spasmodic movements of the ears, lips, etc., followed in serious cases by convulsions, sinking of the eye in its socket,—."

Pott records in cows reddish or bitter milk. In 1934 the falling-off in milk yield in a large herd of cows in southeastern Pennsylvania was no doubt caused by an abundance of creeping buttercup *(Ranunculus repens)* in the pasture. The plant was so abundant among the grass that it was impossible for the cows to eat the grass without consuming a great amount of the buttercup. Such a pasture should be plowed and grown to another crop or left fallow for a season in order to eradicate the buttercup.

The buttercups are so well known by their yellow flowers, that a description is not necessary.

MOONSEED

(Menispermum canadense)

A few years ago some children in Cambria County, Pennsylvania, while strolling in the woods found some berries which they thought were wild grapes. The berries were those of the moonseed vine (Fig. 16a) which is a poisonous plant. The children died from eating these berries.

Since the plant is not very common in the State and because it grows in the woods where animals seldom encounter it, the loss of livestock from the eating of moonseed is practically negligible. But because children do sometimes eat the berries in mistake for wild grapes, they should become acquainted with the plant and the fruit, or better still they should follow this rule:—Never eat any part of any plant unless you are absolutely sure that it is not poisonous.

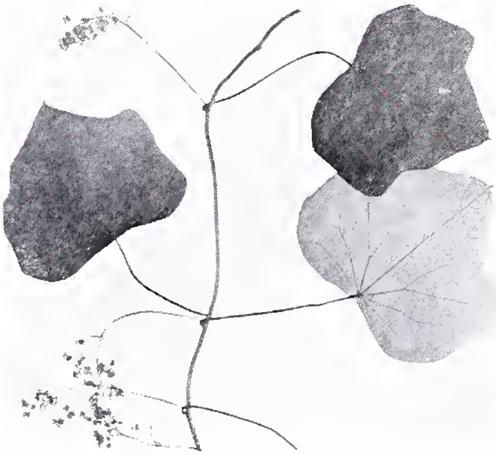

Fig. 16a. Moonseed

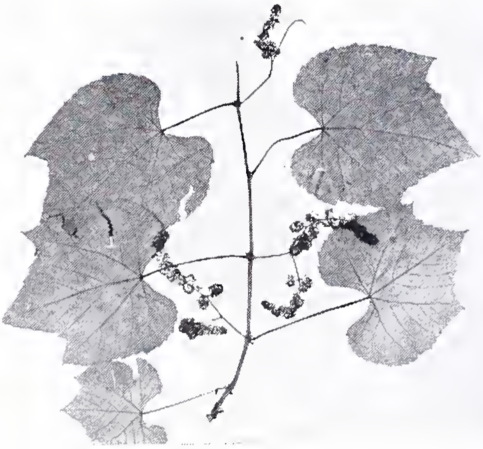

Fig. 16b. Wild Grape

Description. The moonseed plant is a vine with leaves almost like those of the grape vine. The edge of the leaf of the moonseed vine is not toothed while those of the wild grape (Fig. 16b) are. The grape has several slightly pear-shaped seeds while the berry of the moonseed has but one flat almost circular seed. A small notch on the edge of the seed makes it resemble in shape the moon when nearly full. It is from this seed that the plant gets its common name moonseed and the generic name **menispermum.**

MAY APPLE

(Podophyllum peltatum)

May apple (Fig. 17), also sometimes called Mandrake, is, indeed, a well-known medicinal plant. This fact, however, does not assure one of its being harmless; for nearly all medicinal plants produce action on some part of the body which if used in too large quantities renders them harmful or perhaps even fatally poisonous. The dried root-stock is the part used for medicine. In small doses it is an active cathartic, having, also, reputed action upon the liver, which has won for it the occasional name of "vegetable calomel."

Cases are on record where poisoning has been due to continuous large doses. Cattle ordinarily will not eat the plant, but occasionally a depraved appetite for it may be acquired. If eaten by cows it imparts to their milk purgative properties which may be dangerous to those using it, especially to infants. Children sometimes eat the fruit of the may apple. If too many of these apples are eaten, especially if not ripe and soft, serious results may follow. It would be safer to condemn the eating of any part of the plant at any time.

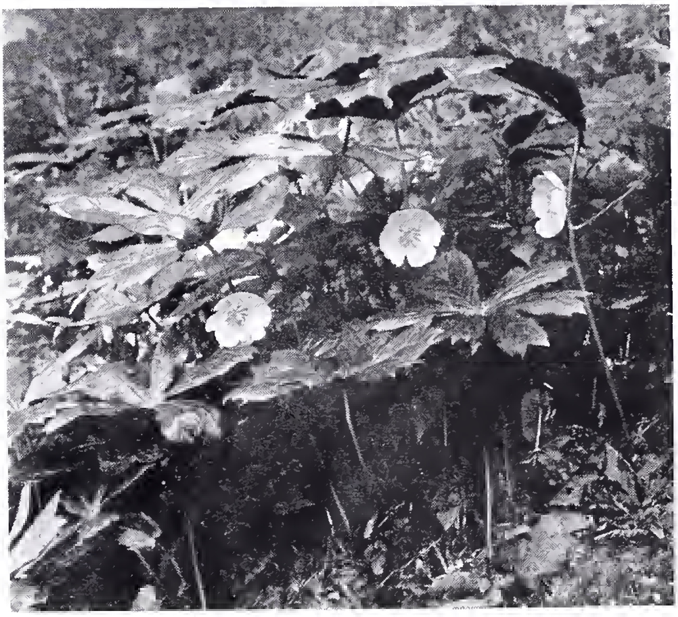

Fig. 17. May Apple

The symptoms of poisoning by may apple are nausea, vomiting, purging, colic, bloody feces, convulsions and death.

Description. The may apple is so well known that a decription of the plant is hardly necessary. The two large umbrella-like leaves are distinct marks of identification. In the axil of these two leaves is borne the one large white flower. The ovoid fruit appears later, which is about the size of a plum when mature. It is firm and green at first but soft and yellow when fully ripe.

DUTCHMAN'S BREECHES

(Dicentra cucullaria)

It has been only a few years since it was definitely known that Dutchman's breeches (Fig. 18) is a poisonous plant. In southern Indiana and northern Virginia where the plant is very common the farmers suspected that it might be the cause of the sickness and occasional death of cattle pastured in the woods in the early spring where this plant was abundant, and when other forage plants were scarce.

This suspicion led the United States Department of Agriculture in cooperation with the Virginia Agricultural Experiment Station to conduct some feeding experiments with Dutchman's breeches. The results of these experiments and tests proved that Dutchman's breeches is poisonous, which cleared up a mystery that had puzzled the farmers in the highland sections of Indiana and Virginia for several generations.

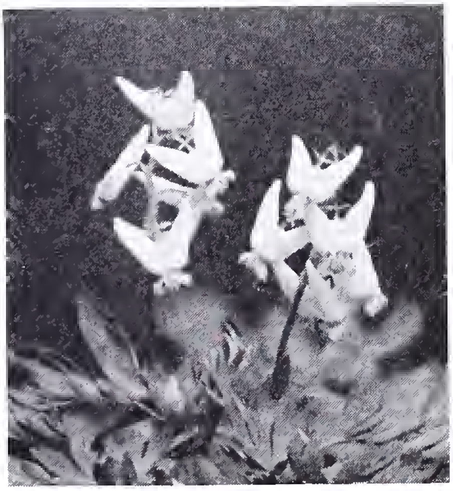

Fig. 18. Dutchman's Breeches

The experience of farmers showed that the plant gave most trouble in the early spring, and that the trouble ceased about the middle of May. This is really what might be expected since the plant is early blooming and the food materials will have been well spent in the flowering and fruiting by that time.

No known cases of human poisoning are on record. However, children and adults too are prone to eat wild plants, and since Dutchman's breeches has a scaly, juicy bulb, it might be used for food by boy and girl scouts and even others who are unaware of its poisonous qualities.

The symptoms of the poisoned animals during the feeding experiments were, first, trembling and nervousness, with the head held high. As the trembling increased there were frothing at the mouth and convulsions. The animal finally fell, the legs became rigid, the head thrown back, eyes glassy, and the animal moaned as if it were in agony. If the poisoned animal is not allowed to eat more of the plant after the appearance of the first symptom, it is believed it will recover.

Description. Dutchman's breeches is closely related to the familiar garden flower known as bleeding heart. The flowers are similar in shape but the color of Dutchman's breeches is white with a tinge of cream color at the tip. Indeed it is sometimes locally called white hearts, also ear-drops. It gets the common name, Dutchman's breeches, from the delicate white flower, which resembles in shape the pantaloons used by Netherlanders. The leaves are much divided and might be mistaken for ferns. The flower stem and the leaves originate from a granular, scaly bulb that separates into many tiny bulblets, each capable of producing a new plant.

Squirrel corn *(Dicentra canadensis)* is a close relative of Dutchman's breeches. Indeed, the leaves of the two plants are so alike that it is very difficult to distinguish the one from the other. However, the bulb and the flowers are different.

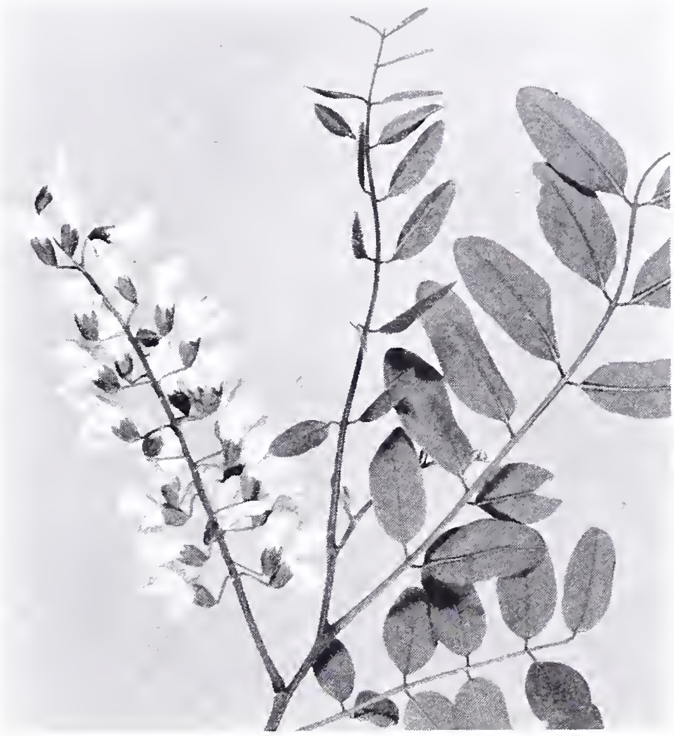

Fig. 19. Locust

The bulbs of the squirrel corn are not granular or scaly but smooth, yellow, rounded grains about the size of a grain of corn, which gives to the plant the common name squirrel corn. The flowers of the squirrel corn are not spurred. What corresponds to the two spurs in the flowers of the Dutchman's breeches are merely two short rounded lobes in the squirrel corn.

Experiments have shown that squirrel corn contains the same poison (Cucullarine) but in less quantity than in the Dutchman's breeches.

BLACK LOCUST

(Robinia pseudoacacia)

Black locust (Fig. 19) contains a powerful poison known as robitin. Animals and human beings have been poisoned by it. On some experimental work conducted by two Japanese scientists, it was found that horses were more susceptible to the poison than cattle. The fresh bark contains a considerable amount of this powerful poison, therefore pastures where young growth of locust is present should be looked upon with much suspicion. Human beings have been poisoned by chewing the bark of this tree. An example of this is on record when, some years ago, thirty-two boys, inmates of the Brooklyn Orphan Asylum, chewed the bark that was being stripped from black locust trees which were to be used for fence posts. All became very ill but none of them died.

The prominent symptoms of the poisoning were vomiting, flushing of the face, dilated pupils, feeble pulse and deathly pallor.

Cattle and other livestock have been killed by eating the tender leaves and shoots of vigorous growing young trees and sprouts, and horses have been fatally poisoned by eating the bark from locust trees to which they have been hitched. One ounce of an infusion of 50 grams of black locust bark in 100 cc of water given to a cat produced in fifteen minutes palpitation of heart, purgation and hypersensitiveness. Another ounce of the decoction killed the cat in eight minutes. *(Poisonous Plants of Alabama,* Circular 71, May, 1924)

The symptoms in horses and cattle are colicky pains, irregular pulse, purging followed by inaction of the bowels, nervous depression and collapse.

The tree is very common in Pennsylvania, particularly in limestone regions. An abandoned field or a vacant lot in a town is often completely covered by a black locust growth. The leaves are not palatable and are not often eaten by livestock except when on young tender shoots, therefore the poisoning occurring from black locust is not frequent considering the amount that is found in the State.

Description. Black locust is a tree which attains a height of about 80 feet. The leaves are compound; that is, each leaf is made up of a number of small leaflets arranged along both sides of a main axis. The flowers which are borne in rather large white clusters are very fragrant and furnish a great deal of nectar. The fruit is a bean similar to the pod of our common lima and other garden beans. Indeed the locust belongs to the same family of plants as the clover, alfalfa, beans and peas.

Prevention again should be the practice of the farmer. Young tender shoots and sprouts should not be allowed to grow in the pasture field. If locust trees are growing in the pastures, the lower limbs should be removed so that cattle cannot reach them. Horses do not often eat sufficient bark from a tree to be poisoned but still there are cases where such poisoning has happened when horses were hitched to a tree. This practice should be discontinued.

SPURGES

CAPER SPURGE *(Euphorbia lathyrus)*
FLOWERING SPURGE *(Euphorbia corollata) (Fig. 20)*
SNOW-ON-THE-MOUNTAIN *(Euphorbia marginata)*

In addition to the above three spurges, there are several other species some of which are prostrate plants. The spurges are, indeed, quite abundant in Pennsylvania. They contain a milky juice that is quite acid and poisonous. Due to the bitter acrid taste the spurges are not often eaten by live stock.

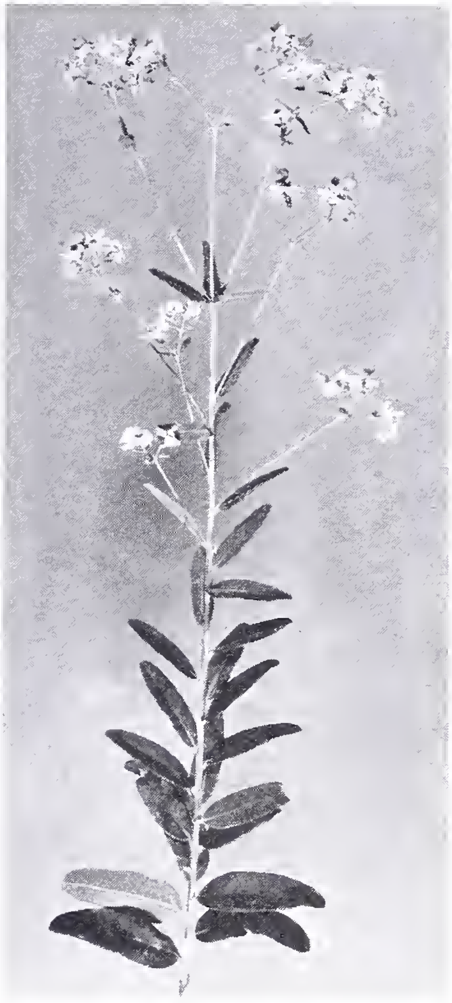

Fig. 20. **Flowering Spurge**

While all spurges contain this milky juice, which makes them poisonous, it is the cultivated species, such as snow-on-the-mountain and caper spurge, which are more likely to cause trouble. Snow-on-the-mountain is common in many flower gardens where it has spread and escaped and may be found in abundance.

V. K. Chestnut in "Thirty Poisonous Plants of the U. S." states that the poison of this plant reaches the stomach through the eating of honey derived from its flowers. While the honey is not seriously poisonous it is hot and disagreeable and causes vomiting and purging.

The milky juice of the spurges often irritates the skin, causing itching, inflammation, pimples and blisters, somewhat similar to ivy poisoning. The blistering action of the juice is so pronounced that it has been used for branding cattle.

POISON IVY, POISON SUMAC AND THEIR RELATIVES*

(Rhus toxicodendron and *Rhus vernix)*

(Figs. 21, 22a, b, c, d)

Many people are very susceptible to ivy poisoning, which is caused by a non-volatile oil. These minute particles of oil come in contact with the skin and cause inflammation followed by little watery blisters which itch and burn, and spread rapidly over the body if not checked. All parts of the plants are poisonous and at all times of the year. Some people are so sensitive to the poison that they believe they get it by merely walking past the plant without coming in contact with it. It might be possible to carry the small oil particles on dust or pollen, but more likely the persons affected have unconsciously come in contact with the plant or perhaps they have got the poison by handling their shoes or some other parts of their clothing that have come in contact with it.

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*From the author's article, slightly modified, published in *Pennsylvania Farmer*, April 19, 1930.

Prevention is easier than curing and those who are susceptible should be cautious and, if possible, not come in contact with the plant. If they have come in contact or suspect that they have been exposed to it, the exposed parts of the body should be washed thoroughly with hot water and soap, or bathed several times with grain alcohol.

Preventives and Remedies. The non-volatile oil is soluble in alcohol and is emulsified by alkalies such as are used in most soaps. Indeed, a good preventive for one who is very susceptible to the poison is to cover his hands and face with a thick lather of soap if he knows that he is going to be exposed to the poison. The lather dries on the skin and the particles of oil settle on the film instead of coming in contact with the skin and may easily be washed off, thus preventing an attack.

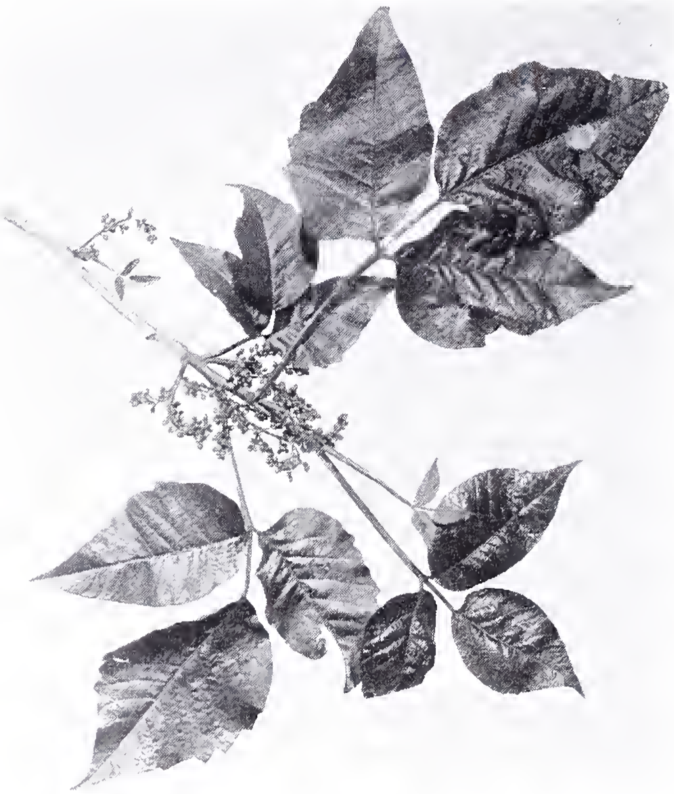

Fig. 21. Poison Ivy

Another preventive is a five percent solution of ferric chloride in a mixture of fifty percent water and fifty percent glycerine. This should be rubbed on exposed parts of the body and allowed to dry without wiping.

Numerous remedies for the cure of ivy poisoning are recommended. One very highly recommended is a three percent solution of potassium permanganate. A five percent solution of ferric chloride in a mixture of fifty percent water and fifty percent glycerine or alcohol is a very effective cure in many cases. The photographers' hypo has been used with success by some victims. A fifty to seventy percent alcoholic solution of sugar of lead in an old remedy. There is some danger in using this when the blisters are broken open. This remedy is also used in the form of a salve.

In severe cases of poisoning by ivy or poison sumac, the victim should consult a physician.

Poison ivy (Fig. 21) is a vine climbing by means of aerial roots which cling by terminal disks to trunks of trees, fence posts and other supports. It is sometimes confused with Virginia creeper from which it may easily be distinguished by its three instead of five leaflets and by its white instead of blue berries.

"Leaflets three quickly flee,
Berries white, take to flight."

There is a low erect shrub form of poison ivy which sometimes covers large areas. These upright branches spring from creeping underground stems. Many people are acquainted with only one form of the plant and, therefore, do not realize that they are both

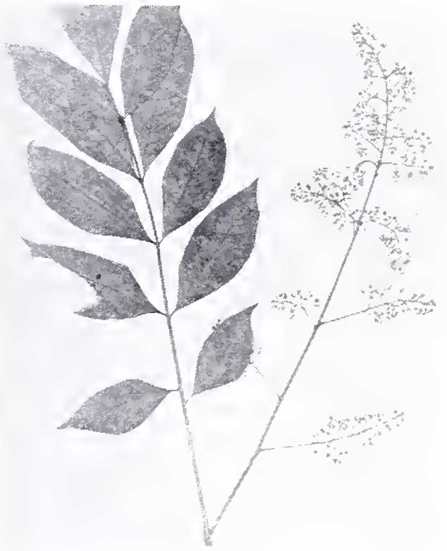

Fig. 22a. Poison Sumac

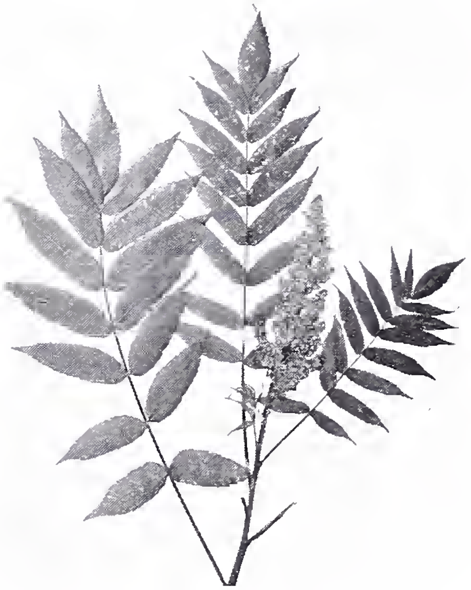

Fig. 22b. Staghorn Sumac

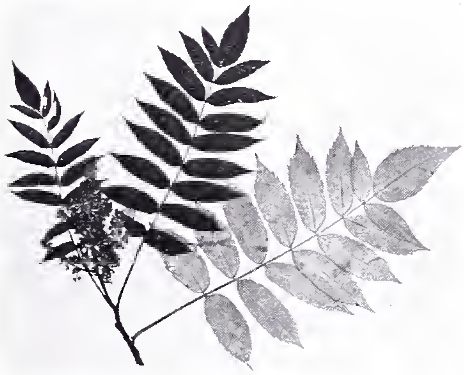

Fig. 22c. Smooth Sumac

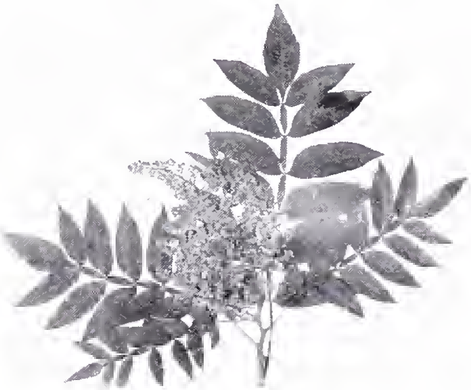

Fig. 22d. Dwarf Sumac

equally poisonous. Both the high-climbing and the low, erect shrub form are very common.

Poison ivy is very abundant and of no economic use whatever, consequently every effort should be made to eradicate the plant. It is difficult to eradicate by digging, because of the danger of becoming poisoned. However, there are several chemicals which may be used to kill it. More than one application may be necessary, because as long as the underground parts are alive new plants will come up.

Among the remedies used in killing poison ivy are the following: Spraying the plants with sodium arsenite—one pound dissolved in five gallons of water; or with iron sulphate—two pounds to one gallon of water; or with sulphuric acid—one pound to five quarts of water; still another spray may be made by adding one pound of white arsenic and two pounds of sal soda to five gallons of water.

Caution. Care must be used in mixing sulphuric acid and water; heat is generated which may cause an explosion. The sulphuric acid must be added very slowly while stirring, and the mixture should be made in an earthenware vessel. This, as well as all the other chemicals, should be handled carefully and kept from the skin and clothing and away from children.

Poison sumac (Fig. 22a), swamp sumac or poison elder *(Rhus vernix)* is a shrub or sometimes a small tree even more poisonous to the touch than poison ivy. Fortunately, it is not so common, being found only in swamps and bogs, especially the latter. It is a near relative of three other shrub forms of sumac— the staghorn sumac (Fig. 22b) *(Rhus typhina),* the smooth sumac (Fig. 22c) *(Rhus glabra),* and the dwarf sumac (Fig. 22d) *(Rhus copallina),* none of which is poisonous but all of which are suspected by those who are not acquainted with the poisonous form.

In the poison sumac the stem (rachis) to which the seven to thirteen leaflets are attached is round and not broad and winged like that in the dwarf sumac, which is a very marked distinction between these two species. In the staghorn and the smooth sumac the leaflets are toothed while in poison sumac there are no teeth on the margin. The characters for distinguishing the four species which might be confused may be summarized as follows:

1. Rachis or stem to which leaflets are attached winged—*Rhus copallina.*

2. Rachis not winged

    a. Leaflets with teeth— *Rhus typhina* and *Rhus glabra.*

    b. Leaflets not toothed— *Rhus vernix.*

Poisoning from poison sumac is caused in the same way that it is by poison ivy, therefore, the same preventive measures and curative remedies are advised. No one should be careless or negligent about poisoning from poison ivy and poison sumac, for death in a few cases has been the result and some people who have been immune have suddenly become susceptible. Only he who has had a bad case of poisoning knows how intense is the suffering.

POISON HEMLOCK

(Conium maculatum)

There seems to be very little doubt that poison hemlock (See cover page) is the plant which was used to execute the Greek philosopher, Socrates, as well as other Greek prisoners. The plant is used medicinally and, while poisoning may occur by mistake in using the drug, nevertheless the chief source of trouble is in eating the dry fruits by mistake for those of anise or the roots for parsnips or the leaves for parsley.

The plant has a disagreeable odor and, therefore, is not often eaten by livestock, but occasionally animals may eat it when the pasturage is scant, or by nibbling at the plant they may acquire a taste for the plant and finally eat sufficient to be fatal.

Poison hemlock probably causes most trouble in the spring when green herbage is not plentiful and the tender, young plants are mixed with other pasture plants. The foliage is more poisonous before the plant blooms than later when the poisonous substances pass into the flowers and fruits. On account of the volatile character of the poisons, the plant largely loses its toxicity when dried in hay and is therefore less likely to prove injurious to livestock.

The general symptoms given by Harold C. Long in the English publication entitled *Plants Poisonous to Livestock* are: "Salivation, bloating, dilation of pupils, rolling of eyes; laboured respiration, diminished frequency of breathing, irregular heart action; loss of sensation, convulsions, uncertain gait, falling, and at the end complete paralysis. Death occurs after a few hours."

Long further states that "small quantities cause in the horse a little prostration, yawning, acceleration of pulse, dilation of the pupil and sometimes muscular spasms of the neck and shoulders"; and that, "large quantities cause nausea, unsuccessful attempts to vomit, gritting of teeth, accelerated respiration and dyspnoea, and muscular tremors commencing in posterior members and spreading to anterior members and spine. There is next difficulty of locomotion, sweating (but not continual), falling, paraplegia, then paralysis, loss of feeling, lowering of temperature, rapid pulse, increasingly difficult respiration, and death from stoppage of respiration.

With cattle there is ptyalism, cessation of digestion, bloating, constipation, weakness and stupor. Pregnant cows have been observed to abort; the milk of cows has an unpleasant flavor."

In the sheep the abdomen is tucked up, the animal has a dazed appearance, there is dilation of pupils, unsteady gait, dragging of hind limbs, coldness and death after a few convulsive movements.

"In the pig there is prostration and inability to move, coldness, slow breathing, livid mucous membranes, imperceptible pulse, paralysis, particularly of the posterior members, and no convulsions."

It will be noticed that the symptoms differ somewhat with different animals and the amount of the poison administered. This may account for the statement made by Chestnut that the poisoning differs from that of the water hemlock in the absence of convulsions; which seems to conflict with the general symptom given by Long, who, while giving convulsions as a general symptom specifically says, "no convulsions" in the pig.

Description. While poison hemlock is not so common as water hemlock, nevertheless it may be found in all sections of Pennsylvania. It is most abundant in the northern part where it is found, usually in colonies, in meadowland and waste places.

Poison hemlock is known by many different local names. Among these are deadly hemlock, spotted cowbane, spotted parsley, poison stinkweed, wode whistle and herb of St. Bennet.

It is a close relative of wild carrot and water hemlock, both of which it resembles in some respects. The plant ranges in height from two to ten feet, depending upon the fertility of the soil. It has a smooth, hollow, much branched stem which is usually purple-spotted. The leaves are finely divided. The flowers are in clusters, called umbels, resembling very much those of wild carrot or Queen Anne's lace. Each large umbel is composed of smaller clusters, called umbellets, and each umbellet contains a number of small white flowers. Each flower forms a fruit made up of two seed-like carpels, grayish brown in color, prominently ribbed and about one-eighth of an inch long. The whole plant has a musky disagreeable scent which is often described as a "mousy odor."

WATER HEMLOCK

(Cicuta maculata)

About 2:30 p.m., March 28, 1934, two young men working on a civil works administration project in Somerset County, Pennsylvania, found some roots which they thought were those of sweet anise, but which proved to be roots of water hemlock. Both men ate some of these roots. One man fell to the ground in a very severe convulsion at 4:00 p.m. and continued to have convulsions every five to eight minutes until 7:15 p.m. when he died. He never regained consciousness after the first convulsion.

The other man who had eaten the roots drank some water shortly afterwards and vomited. He, too, became suddenly ill and had some convulsions, but in two or three days, he recovered and was able to return to work.

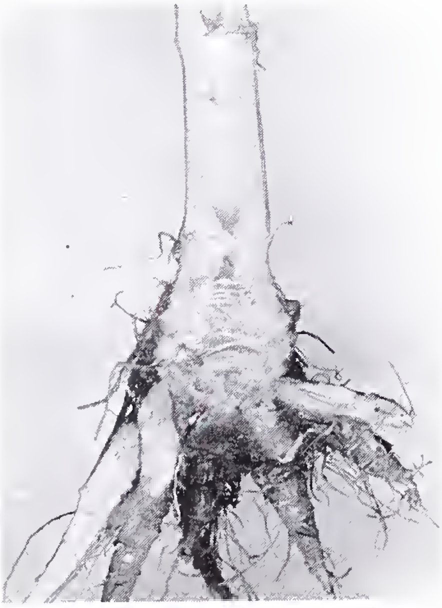

Fig. 23a. Water Hemlock Roots

A few years ago about the middle of May, a Pennsylvania farmer lost a pony, a horse and three head of cattle within a few days. Upon investigation it was found that water hemlock was the cause.

Many other cases are on record but it is unnecessary to enumerate more since it is definitely known that water hemlock is extremely poisonous and that much loss of livestock is caused every year by this plant, which is very abundant throughout Pennsylvania.

Water hemlock (Figs. 23a and 23b) causes most trouble in the young stage when it is full of sap and growing rapidly. At this stage it is eaten more freely than later in the season when the stem becomes hard and somewhat woody. While the poison cicutoxin is said not to be destroyed by drying, nevertheless little trouble has been noticed from feeding hay in which the plant may be found. No doubt here again it is not eaten due to the hard and unpalatable condition of the nearly matured dried plant.

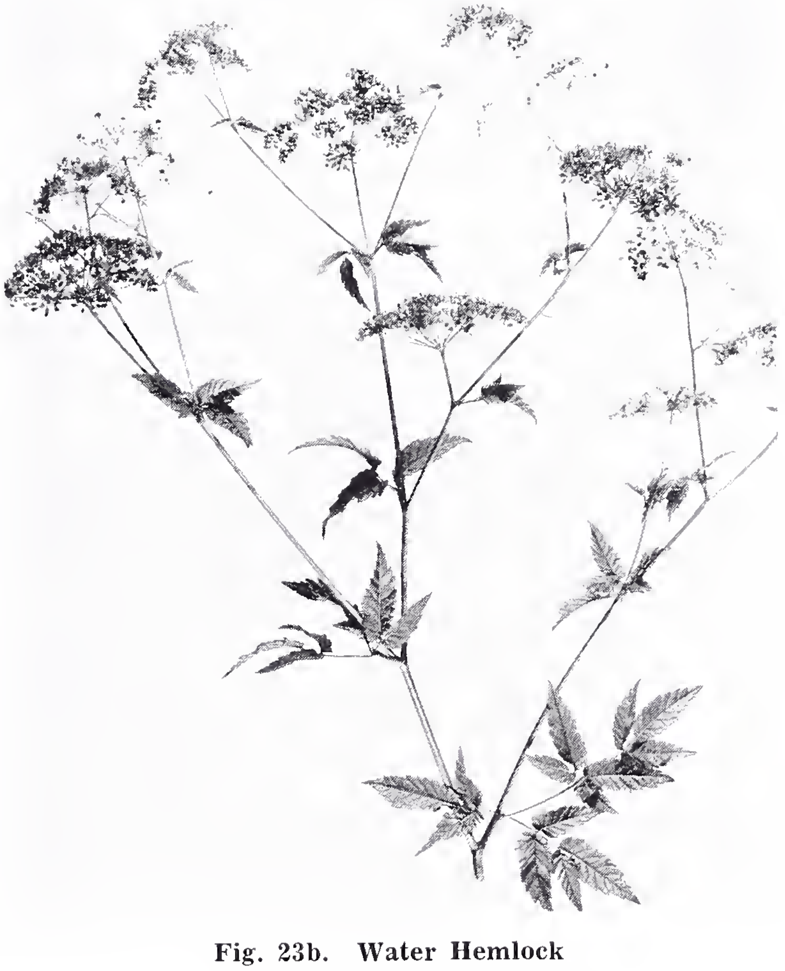

Fig. 23b. Water Hemlock

All parts of water hemlock are extremely poisonous. A piece of the root the size of a pea will kill an adult human being. Cattle have been poisoned by drinking water which stands in little pools where they have tramped about and crushed some of the water hemlock roots. All farm livestock are susceptible to the poison but it is more likely to be fatal with ruminants such as cattle that cannot empty the stomach by vomiting. The symptoms with poisoned livestock are similar to those given for human beings. The symptoms of poisoning by water hemlock are: "Salivation, vomiting (in swine), nausea, colic (in horse), bloating (in cattle), diarrhea, irregular pulse and heart, dilation of pupils, rolling of eyeballs, vertigo, reeling in circles, twisting of neck, falling down, automatic movement of limbs, opening and shutting of mouth, and death, usually with convulsions, in from half an hour to an hour after first manifestation of symptoms."

Description. Like many wild plants, water hemlock is known locally by many common names; among these are: musquash-root, beaver poison, children's bane, snakeweed, spotted parsley, muskrat weed, cowbane, and death-of-man.

It is found commonly in meadows, particularly in swampy places and along streams.

The clustered roots are thick and fleshy and not very deep in the soil, hence they often become exposed and are picked up and eaten by mistake for parsnips, artichokes, sweet anise or some other edible root.

One of the best distinguishing features of the plant is the swollen part of the stem, commonly called the rootstock. This is the portion just above the point where the clustered roots originate. If this rootstock is split open one will see partitions running crosswise which divide the rootstock into chambers. In the early spring these chambers are filled with a liquid but later they are empty. The stem of the plant which may grow to the height of eight feet is hollow except at the joint where the leaves are attached. It is usually streaked with purple lines. The color is usually more pronounced at the juncture of the stem and branches. The leaves are called bipinnate or tripinnate due to the fact that they are twice or thrice divided. The leaflets are narrow, pointed and rather coarsely toothed.

The flowers are arranged in clusters called umbels, similar in appearance to the well known wild carrot or Queen Anne's lace. Like all the Parsley Family, the flowers are very small. There are five white petals and five stamens and a two-celled ovary with one seed in each cell. The fruit when mature is about an eighth of an inch long, striped with corky ribs.

On account of the great yearly loss caused by this poisonous weed, farmers should be careful to eradicate the plant. It grows only in the lowlands and when the ground is wet and soft, it can be pulled up quite easily. The plants should then be gathered together and burned. Take no chances in leaving them on the ground.

COW PARSNIP

(Heracleum lanatum)

Cow parsnip (Fig. 24) is a very robust plant which is found rather commonly in moist places in Pennsylvania. While it is not considered a very poisonous plant and perhaps few if any cases of poisoning from eating the plant have been recorded, nevertheless it should be looked upon with suspicion.

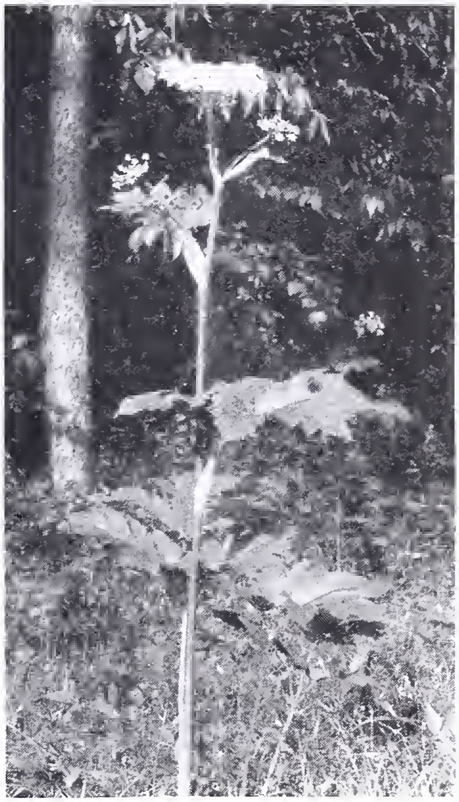

Fig. 24. Cow Parsnip

New Jersey in Circular 261, October, 1932 reports that, "Occasionally cattle eat either the leaves or roots, and are poisoned by them, but this occurs only when plants are young and tender, or when forage is extremely scarce. They usually avoid the plant on account of its strong odor."

This circular also reports irritation of the skin due to the poison element known as "heraclin." It suggests the same treatment as is used for ivy poisoning.

Description. Cow parsnip is a large plant sometimes attaining the height of nearly eight feet. The hollow stem is grooved and covered with matted white hairs. The large leaves are deeply lobed and toothed. The flower cluster is a large white umbel typical of many plants of the Carrot or Parsley Family, to which belong both the poison hemlock and the water hemlock.

MOUNTAIN LAUREL

(Kalmia latifolia)

Sometimes death lurks in our most beautiful plants. Such is the case with mountain laurel (Fig. 25) which was chosen by the 1933 Legislature as the State flower of Pennsylvania.

Cattle, sheep, goats, horses and sometimes people die of eating the leaves of this shrub. Chickens have been poisoned by eating vomit of poisoned animals. Well-cleaned and well-boiled meat of poisoned animals has been fed to cats with almost fatal results. The honey derived from the nectar of the flower appears to be poisonous under some conditions.

A case is reported where six trained goats in the Philadelphia Dime Museum in 1894 died of eating laurel which had been used to decorate the stage.

V. K. Chestnut states that cases of human poisoning occur by using it medicinally in overdoses, or probably by the secret and criminal use of the leaves to increase the intoxicating effects of liquors. Children sometimes mistake, with fatal results, the leaves of the young tender plants for those of wintergreen *(Gaultheria procumbens)*, which is ordinarily found growing in the same habitat.

Cattle poisoning occurs most frequently in the spring when driven along a path or road where laurel may be growing. The cattle being fed during the winter on dry feed are eager for green forage and are much more likely to eat laurel as well as other poisonous plants under such conditions. Young cattle are more likely to be poisoned than the older ones which have learned to avoid it.

In many Pennsylvania pastures, especially in mountainous sections, mountain laurel is abundant but under favorable conditions it is not eaten. If the pasturage becomes scant there is danger that it will be eaten in the absence of better forage plants.

The symptoms from laurel poisoning given by Chestnut are: "persistent nausea, with slight but long-continued vomiting and attempts to vomit, frothing at the mouth, grating of teeth, irregular breathing, partial or complete loss of sight and feeling, dizziness, inability to stand, extreme drowsiness, stupor, and death. The irregularity of the respiration is most characteristic, being present throughout the main part of the attack. In addition to most of the above effects there is, in man, severe pain in the head, an increased tendency to perspire, and often a peculiar tingling sensation in the skin throughout the entire body. Vomiting is very copiously produced, and consequently the effects are generally less severe than in animals."

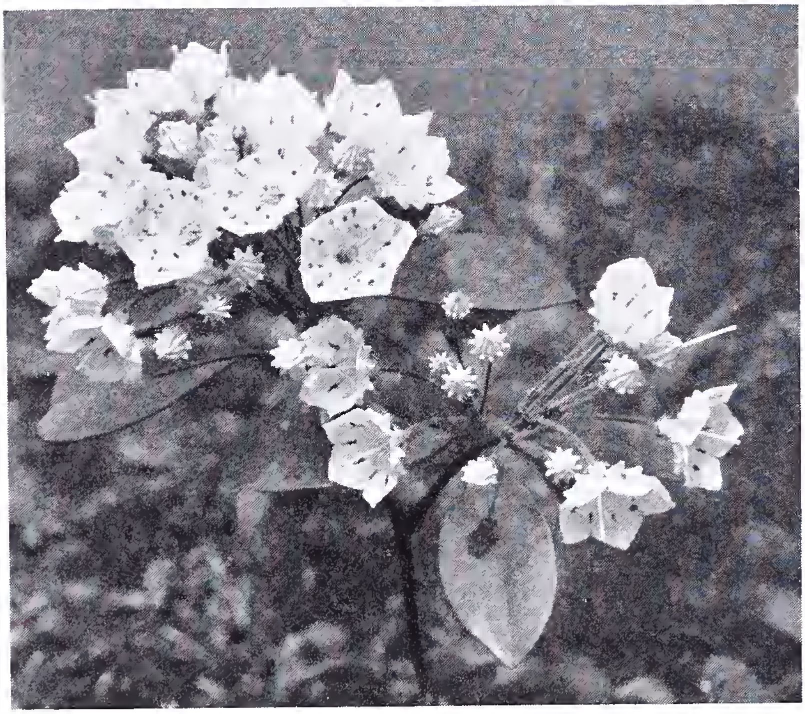

Fig. 25. Mountain Laurel

The U. S. Department of Agriculture in its Technical Bulletin, No. 219, December, 1930 in which is given a very complete experimental discussion on mountain laurel and its near relative the sheep laurel, suggests as a remedy for laurel poisoning linseed oil, giving as a desirable dosage for sheep four fluid ounces (120 c.c.), repeated at intervals of two or three hours.

Description. Mountain laurel has a rather wide distribution in eastern North America. It extends from New Brunswick southward, generally along the mountains, to Florida and westward to Arkansas. In the north it is not a large shrub. In Pennsylvania it may attain a height of fifteen feet but in the South shrubs forty feet high with a stem diameter of twenty inches may be found.

The leaves, which are evergreen and three to four inches long, are thick, leathery, dark green and glossy above, and yellowish green on the under surface. The flowers which open about May or June are borne in dense, many-flowered clusters called corymbs. Each flower is complete with a five-parted calyx, a white or rose-colored, five-lobed, glandular corolla, one-half to one inch in diameter when fully expanded, ten stamens, and one pistil which ripens into a persistent, almost globular, five-lobed capsule with many small seeds.

In color and design, the corolla is interesting and unique. On the inner surface of the cup-shaped corolla are ten dark-colored pockets into which the anthers of the stamens fit snugly. The outwardly bent filaments of these stamens are under a spring-like tension until the anthers are released from the pocket by the visiting insect as he alights upon the flower in search of the nectar which the flower abundantly secretes. When the anther is released from the pocket the filament quickly bends inward and with a very quick trigger-like motion the anther is thrust toward the center of the flower, where it strikes the hairy insect and dusts it with pollen, which is carried to the stigma of another flower, thus producing cross-pollination.

As a precaution against poisoning, farmers should remove it from their pastures and from along driveways where cattle may browse upon it.

SHEEP LAUREL

(Kalmia angustifolia)

In general the symptoms produced by sheep laurel (Fig. 26) are almost identical with those of mountain laurel, which is to be expected as both contain the same poison principle, andromedotoxin.

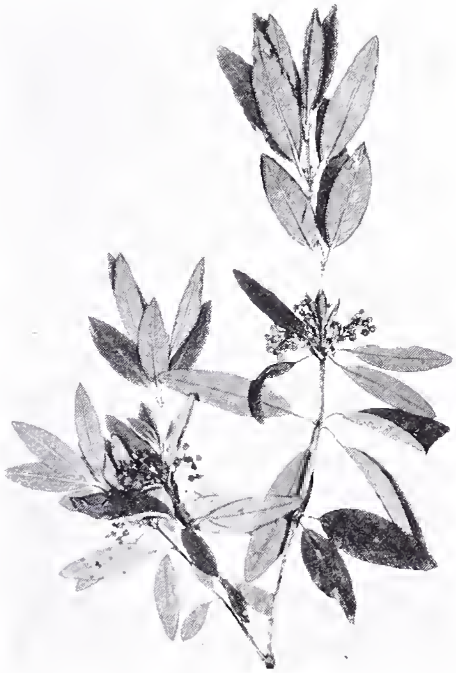

Fig. 26. Sheep Laurel

Sheep laurel is known by a number of other names, such as lambkill, sheep poison, lamb laurel, dwarf sheep laurel, small laurel, low laurel, dwarf laurel and wicky.

It is not so widely distributed in Pennsylvania as the mountain laurel, being found chiefly in the northern part of the state, especially in the higher plateau regions.

Sheep laurel is only about eighteen inches to two feet high, with opposite or whorled leaves, dark green above, lighter green or whitish beneath. The purple or crimson flowers are in clusters not at the extreme end of the stem, but at the base of the new shoots,

SPREADING DOGBANE

(Apocynum androsaemifolium)

and

INDIAN HEMP

(Apocynum cannabinum)

These two plants which are difficult to distinguish, one from the other, unless they are in flower have been suspected of being poisonous. Some experimental evidence to corraborate this belief is now on record.

Dr. Wilson of the Arizona Experiment Station conducted some experiments in which he found that 15 to 20 grams of the green leaves, and 15 to 30 grams of the dry leaves were sufficient to kill a horse (one ounce is equivalent to about 28 grams). A little less was enough to kill a cow. To kill a sheep it required only from 1 to 5 grams.

The symptoms of poisoning by these plants are increased temperature and pulse, warm body, cold extremities, sweating, dilation of the pupils of the eye, discoloration of mouth and nostrils, followed by sore mouth. The animal refuses to drink for 24 hours preceding death. There is frequent bowel action with the feces usually greenish in color.

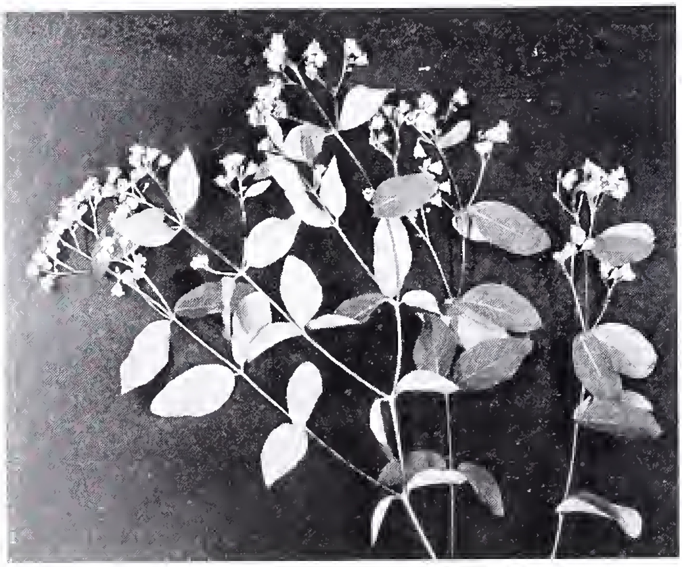

Fig. 27. Spreading Dogbane

These plants may cause much more loss in Pennsylvania than is suspected because the symptoms are similar to those due to other causes.

Description. Both of these plants are very common in Pennsylvania. Indeed, they might be classed as rather noxious weeds in many places, especially in pasture field which are not frequently tilled. They are also found in thickets and open woods. The plants are perennial, from two to five feet high. A mark of identification is the milky juice like that of milkweeds, for which they are often mistaken. The fruit is a long, slender pod like that of the milkweeds but much more slender, about the thickness of a slender pencil and four or more inches long.

These pods hang in twos, and when they burst open at maturity the flat brown seeds tipped with white floss are carried everywhere by the wind.

The flowers of the two species are somewhat different. Those of the spreading dogbane (Fig. 27) are larger, distinctly pink in color and with recurved or spreading lobes of the corolla. The flowers of the Indian hemp are smaller, of a rather greenish-white color, with the lobes of the corolla very short and slightly, if at all, recurved.

BLACK NIGHTSHADE

(Solanum nigrum)

Other common names of this plant (Fig. 28) are deadly nightshade, garden nightshade and nightshade. The word "deadly" applied to the plant has given many people the impression that it is the most poisonous plant in the State. Under certain conditions and at different stages of growth, it does contain a poison while at other times it seems to be much less poisonous. The ripe berries are sometimes eaten without ill effects, but certainly no part of the plant at any time of its growth should be used for food. The chances of being poisoned are too great. Cases of poisoning are recorded for calves, sheep, goats and hogs.

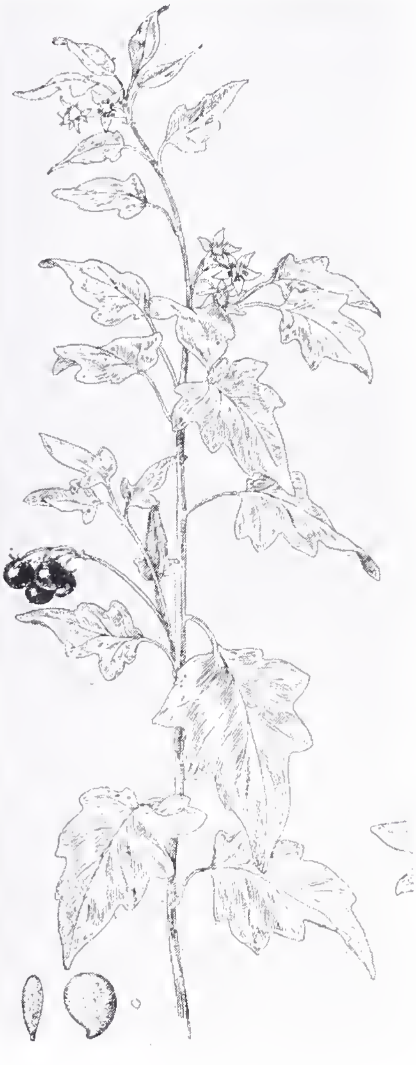

Fig. 28. Black Nightshade

Black nightshade is quite common in pastures, waste places, and about dwellings. It is also found in meadows and sometimes in cultivated fields.

The symptoms of poisoning in both humans and animals are stupefaction, loss of feeling and consciousness, cramps, convulsions. The pupils of the eye are generally dilated. Death results from paralysis of the lungs.

Description. Black nightshade is an annual plant from one to two feet high, with rather weak spreading branches, especially when grown in rich, moist soil and partial shade. The ovate leaves are from two to four inches long with wavy margins. The flowers are small and white similar to those of the potato plant to which it is closely related and to which it has a slight resemblance. The berries are black when ripe and about the size of a huckleberry. They ripen from July to October.

JIMSON WEED

(Datura stramonium)

Cases of poisoning by jimson weed (Fig. 29) have occurred from its use as medicine in overdoses. Children have been fatally poisoned by eating the prickly fruit, especially the seeds. Harshberger in his book "Pastoral and Agricultural Botany" gives an interesting account of three children who were brought into his father's drug store, having eaten the seeds of jimson weed. He says: "They were all suffering from the effects of the poison. Emetics were given and his father took the three children into the back yard and compelled them to run about by whipping the calves of their legs with a carriage whip until they broke into a profuse perspiration. Their lives were saved by this and other heroic treatment."

Children have been poisoned also by sucking the flowers while playing with them. While animals usually avoid the plant on account of its unpleasant odor and taste, cases are on record in which cattle have been poisoned by eating the leaves of young plants in hay.

The symptoms of poisoning are headache, dry burning skin, nausea, extreme thirst, nervous confusion, dilated pupils with loss of sight and voluntary motion, rapid action of the heart, convulsions and death.

Description. There are two species of jimson weed: *Datura stramonium* and *Datura tatula*. They are so much alike that they have been included in one by some botanists.

There are other common names, among which are Jamestown weed, common stramonium, thorn apple, apple of Peru, devil's apple, mad apple, stinkwort and Jamestown lily.

The plant is quite common in Pennsylvania around farm buildings, in rubbish heaps about towns and cities, and in waste places.

It is an annual, robust plant with large leaves and large white or purplish funnel-shaped flowers two to four inches long. The large, prickly fruit with many blackish-brown seeds is very conspicuous in late summer and fall.

Since the roots do not live over winter the plant can be eradicated by not allowing it to go to seed.

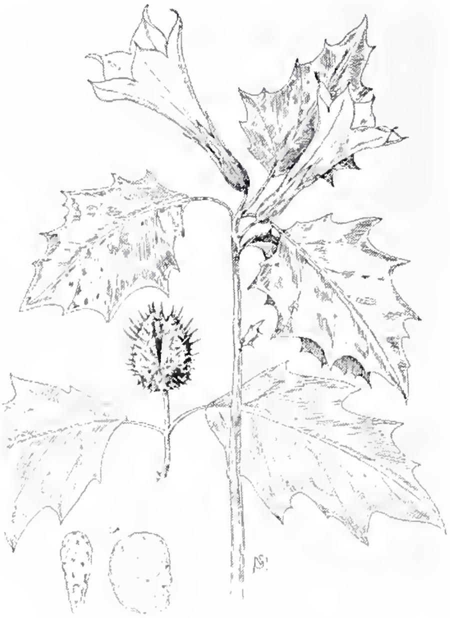

Fig. 29. Jimson Weed

WHITE SNAKEROOT

(Eupatorium urticaefolium)

Milk-sickness, now a rather rare disease, was quite prevalent among the early settlers of the United States. It was common in Maryland, North Carolina, Kentucky, Tennessee, Alabama, Missouri, Illinois, Indiana, and Ohio. Epidemics frequently occurred which wiped out as much as one-fourth of the population of the area and in a few cases almost the whole population of certain villages succumbed to the dread disease.*

It is reported that milk-sickness was the cause of the death of Lincoln's mother.

The symptoms of poisoning in human beings are weakness, vomiting, severe stomach pains, smothering feeling, delirium and prostration; in cattle and sheep, inactivity. The animal prefers to lie down and must be forced to walk about. The hind legs become stiff and are dragged when walking. If forced to exert itself the animal trembles violently and often sinks to the ground in a fit of trembling. Between the attacks of visible trembling, fine tremors can be felt in the muscles, especially in the hind legs, though frequently the skeletal muscles of the whole body are involved. As the disease progresses the animal becomes weaker and fails to respond to any stimulation and finally dies in a state of profound depression.

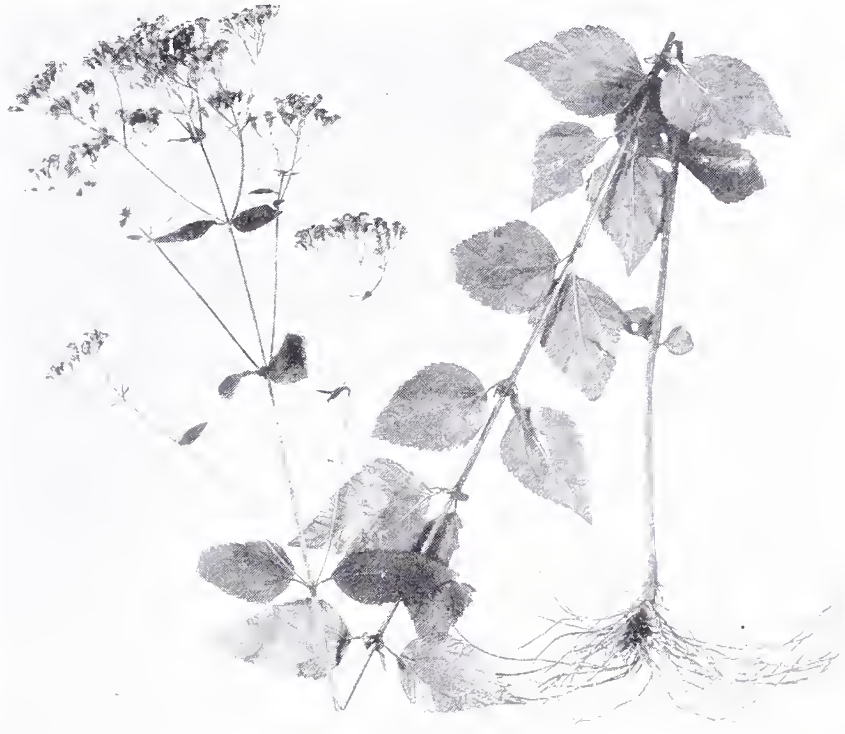

Fig. 30. White Snakeroot

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* Journal of the Tennessee Academy of Science, January, 1934.

It is not definitely known what the toxic substance causing trembles in animals and milk-sickness in human beings is. Evidence seems to show in the body an increase of nitrogenous compound known as Guanidine, the accumulation of which must contribute to the severe symptoms of intoxication and be responsible for a lowering of the blood sugar.

A fact that must be noted is, that a cow may eat white snakeroot in quantity sufficient to poison those who drink the milk while she may not be noticeably affected. This is evidently due to the fact that the poison is passed off through the milk with but little effect upon the health of the animal.

In experimenting at the North Carolina station, a cow was fed white snakeroot in sufficient quantity to produce trembles. A calf was then fed the milk and died of trembles, and butter made from the milk killed rats in a few hours.

Description. White snakeroot (Fig. 30) which is a very abundant plant in Pennsylvania is known locally by many different common names. Among these are white sanicle, Indian sanicle, richweed, hemp agrimony, upland boneset, stevia, and nettle-leaved sanicle.

In Pennsylvania, it is generally called white snakeroot and upland boneset. It is a woodland plant and therefore has decreased with the reduction of our forest areas. However, the plant is still quite common throughout Pennsylvania and is still causing loss of livestock particularly where pasture fields include wooded areas.

The roots which are in a cluster are quite slender and fibrous from which the plant, no doubt, gets the common name snakeroot. The roots are perennial but the stem is herbaceous and annual. The plant will likely be passed unnoticed in the early part of the summer because it does not begin to bloom until the latter part of July. It continues to bloom until late fall. The stem is usually from one to four feet high. The leaves are opposite, ovate, sharp-pointed, with three prominent veins and toothed margins. The small white flowers form heads which are arranged in rather loose, spreading clusters.

White snakeroot is a close relative of the medicinal plant called boneset or thoroughwort and of Joe Pye weed or Queen of the meadow.

At present there is no very well known treatment of the disease. In the Tennessee experiment cited above it was found that intravenous injections of Calcium Gluconate showed temporary improvement.

Every farmer should learn to recognize the plant and make an effort to eradicate it, which can be done quite easily by pulling when the soil is moist.

COCKLEBUR

(Xanthium spp.)

In the March 16, 1935 issue of *Wallaces' Farmer and Iowa Homestead,* the following statement is made: "Young cockleburs in the two-leaf stage are fatally poisonous to sheep, hogs and cattle. This discovery has cleared up the cause of many mysterious losses of livestock, particularly pigs, that occur every spring.

"Poisoning usually occurs when wet lands, such as over-flow land in the spring, or land made wet by spring rains, begins to dry, since it is then that the dangerous sprouts (seedlings) appear by the thousands. In the poisonous condition, the two leaves are long and narrow, having no resemblance whatever to the leaves of mature cockleburs."

Cocklebur (Fig. 31), also called clothbur, is a very common weed in Pennsylvania and may, indeed, cause much more loss of livestock than is known.

All kinds of animals are susceptible but young pigs and colts are most often the victims.

As is often true, plants are most toxic in certain stages of growth. It is the cotyledons of the seedlings of cocklebur which cause poisoning. When the seed germinates the first visible part of the plant above the ground are two slender, almost grass-like, leaves. These two leaves are the cotyledons. They do not have the least resemblance to the later leaves of the plant. These cotyledons are tender and juicy and are often eaten freely by animals, especially, hogs.

The symptoms of poisoning are, "depression, weakness, unsteady gait, labored respiration, nausea, accompanied with vomiting, rapid and weak pulse, and a low temperature. Before death there are, frequently, spasmodic movements, but animals sometimes die very quietly. The symptoms ordinarily appear within twenty-four hours after the plant is eaten and commonly continue for only a few hours.

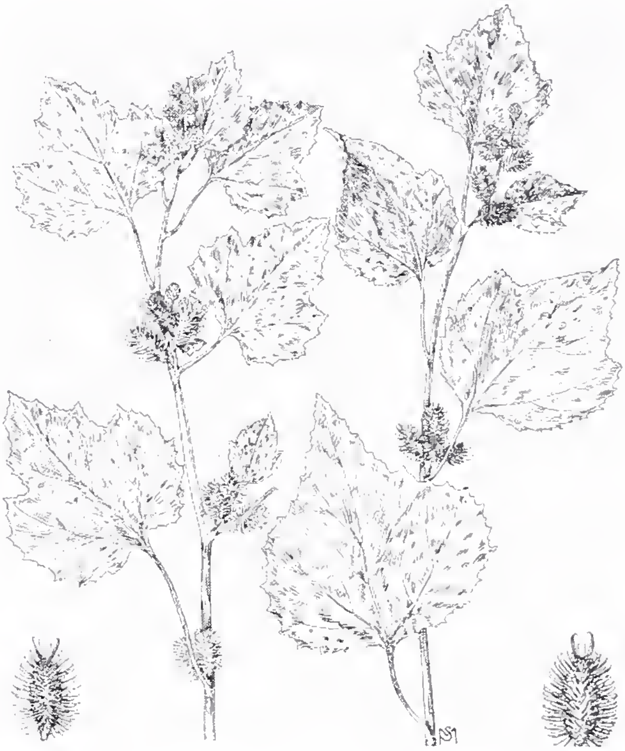

Fig. 31. Cocklebur

"Autopsies show more or less inflammation and congestion of the alimentary canal and related parts, with an unusual quantity of serum in the abdominal cavity, and frequently a jelly-like accumulation about the gall bladder and its ducts."

In addition to poisoning by cocklebur, the burs of the mature plant may cause mechanical injury by irritating the alimentary canal or by becoming matted together to form balls which cause intestinal obstruction. It has also been claimed that the burs have caused trouble by becoming lodged in the throat. By becoming entangled in the wool of sheep, the burs may cause considerable dockage in the price of the wool.

In the U. S. Bulletin published by the Department of Agriculture in 1924, the following paragraph on remedies is quoted: "Based on the statement that pigs fed on fresh milk are not poisoned, experimental work has shown that beneficial results follow the administration of oil or fats. For this purpose linseed oil, bacon grease, or lard can be used."

Description. Cocklebur is very plentiful in Pennsylvania. It is a weed in waste places, around farm buildings, hog pastures and elsewhere. It may be found in almost any kind of soil, especially where it is moist.

There are several different species, all equally poisonous so far as known, and resembling each other so closely that differentiation is difficult at all stages of growth.

The plant does not resemble closely any other kind of plant and may be easily recognized by its broad leaves and burs when in fruit. The mature plant is from one to two feet tall. The leaves are thick, rough and broadly ovate, and mostly somewhat lobed.

TANSY

(Tanacetum vulgare)

Tansy is found in many old gardens and waste places. Livestock are very unlikely to eat the plant because of its bitter, acrid taste. Serious cases of human poisoning have been reported and Kobert of Germany believes that cattle have been poisoned by eating tansy.

The oil of tansy has long been known to medicine; however, it should be used only upon the advice of a physician, as it is a dangerous drug.

A few years ago a number of cases of cattle abortion on two farms in northern Pennsylvania seemed to be attributable to the tansy which had escaped from cultivation and was growing in abundance among the grass in the night pasture lots where the cows were kept.

The symptoms of poisoning by tansy are: "convulsions, violent spasms, frequent and feeble pulse, and paralysis of the heart and lungs inducing a condition similar to that observed in rabies." According to Pott (German authority), "the tansy imparts a bitter taste to the milk of cows which eat it." The oil of tansy is a known abortifacient.

Description. Tansy is a stout plant from 1½ to 3 feet high with finely dissected leaves and yellow flowers. A mark of distinction is its strong odor and bitter taste. The oil which emits the strong odor is sometimes mixed with that of fleabane and pennyroyal and diluted with alcohol to make a rather efficient mosquito repellant.

COMMON SNEEZEWEED

(Helenium autumnale)

The common name of this plant (Fig. 32) is derived from its medicinal property of producing violent sneezing when the powdered flowers and leaves are snuffed up the nose.

The plant is known to be quite poisonous to animals; but it is not often eaten because of its bitter taste. However, cattle have been known to acquire a taste for sneezeweed. The most poisonous part of it seems to be the flowers. The young plant is thought to be only slightly dangerous, and the mature plants seem to vary as to the amount of poison which they contain. Perhaps more loss of livestock in late summer and fall than is known is due to sneezeweed.

In feeding tests made on domestic animals the following symptoms were noticed: Accelerated pulse, labored breathing, sensitive skin, staggering, sweating, dilated pupils, irritated stomach and intestines, convulsions and death. The bitter principle of the plant is transmitted to the milk of cows. The action of the poison is said to be similar to that of strychnine.

Description. Sneezeweed is known by other common names, among which are sneezewort, autumn sneezeweed, staggerweed, swamp sunflower and false sunflower.

The plant, which may attain a height of eight feet, has alternate leaves and a marked winged stem and a cluster of flowers with drooping yellow rays. The flowers resemble the wild sunflower and the plant is often mistaken for one of the many species of wild sunflower.

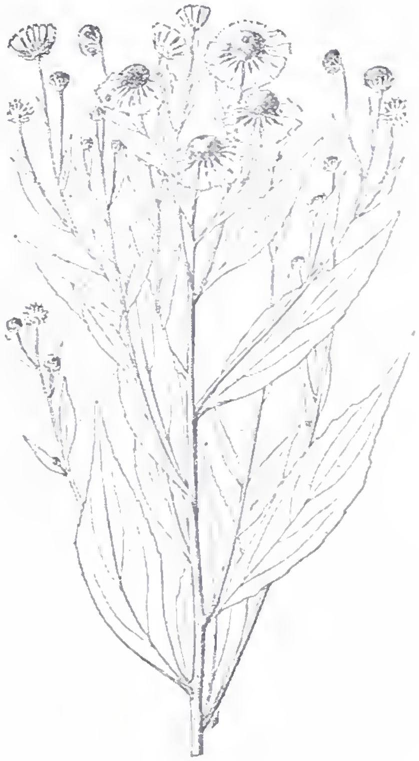

Fig. 32. Sneezeweed

The winged stem is a mark of distinction but must not be confused with that of a similar plant which is more commonly called "winged stem" and whose scientific name is *Actinomeris alternifolia*. The rays of the flowers of sneezeweed are short and drooping while those of the common "winged stem" are much longer and ordinarily horizontal.

Both of these winged stem plants are very common in Pennsylvania swamps and meadowland and are in bloom in late summer and autumn when the ironweed and Joe Pye weed are seen so abundantly in our meadow pastures.

MISCELLANEOUS POISONOUS PLANTS OF MINOR IMPORTANCE

The following plants may not have caused any serious trouble. However, if found in large quantities, they should be looked upon with suspicion.

Angelica *(Angelica villosa)* — Suspected as being poisonous, doubtful.

Bindweeds *(Convolvulus sepium* and *C. arvensis)* — Both of these species are bad weeds in Pennsylvania. They are not considered very poisonous but have caused trouble when eaten in large quantities. Pigs have been killed by eating the roots.

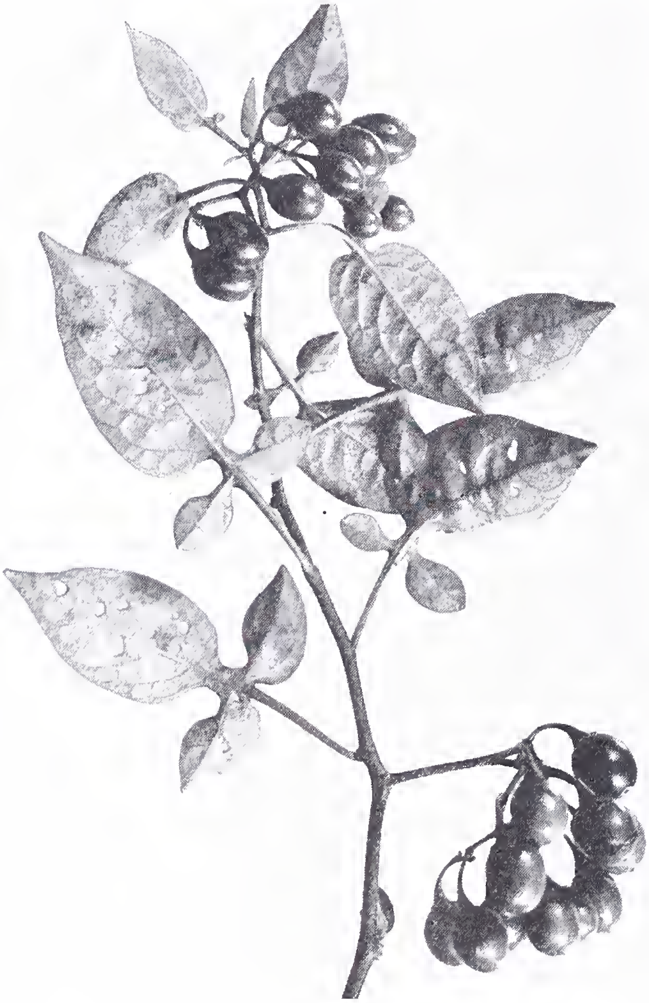

Fig. 33. Climbing Nightshade

Bitter-sweet *(Celastrus scandens)*—Not usually eaten in sufficient quantity to cause trouble.

Bouncing Bet or Soapwort *(Saponaria officinalis)*—Irritant of mucous membrane of digestive tract.

Box *(Buxus sempervirens)*—This hedge plant is sometimes eaten by animals with fatal results.

Button Bush *(Cephalanthus occidentalis)*—Common in swamps throughout the State. Not often eaten. Perhaps it should be looked upon with more suspicion than it is.

Castor Oil Bean *(Ricinus communis)*—All animals including man are susceptible to the poison. It causes nausea, vomiting, violent purging, bloody diarrhea, and dullness of vision.

Celandine *(Chelidonium majus)*—This plant is quite common in Pennsylvania. It has long been used as a medicinal plant having emetic and purgative properties. The plant is poisonous but seldom eaten in sufficient quantity to be fatal.

Climbing Nightshade *(Solanum dulcamara)* (Fig. 33).—This vine is frequently used as a porch vine. The ovoid, red berries are sometimes eaten by children. There is contradictory evidence as to its poisonous character. Cases of poisoning of children and livestock are recorded, therefore, it should be looked upon with suspicion.

Cowbane *(Oxypolis rigidor)*—Grows in swamps. Thought to be poisonous. Similar to water hemlock.

English Ivy *(Hedera helix)*—This plant is used as an ornamental especially on walls of houses. Children have been poisoned by eating the berries.

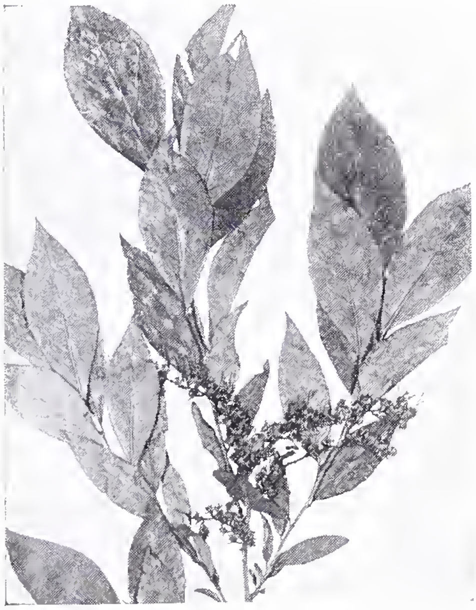

Fig. 34. Fetter Bush

Fetter-bush *(Leucothoe racemosa)* (Fig. 34)—Found only in southeastern Pennsylvania. So far as known no reports of poisoning from Pennsylvania have been recorded.

Foxglove *(Digitalis purpurea)*—Very poisonous, found only very rarely as an escape from cultivation.

Garlic and Wild Onion *(Allium spp.)*—Cause disagreeable flavor to milk.

Hemlock Water Parsnip *(Sium cicutaefolium)*—Said to be poisonous. A swamp plant, similar to water hemlock.

Indian Tobacco *(Lobelia inflata)*—The plant contains an emetic poison which may produce convulsions and even death. It is very common in Pennsylvania; however, it is seldom, if ever, eaten in sufficient quantity to cause much, if any, trouble.

Lobelia syphilitica and *Lobelia spicata* are similar in poisonous qualities.

Iris or Common Blue Flag *(Iris versicolor)*—Said to cause irritation of intestines, also acts on liver and pancreas.

Labrador Tea *(Ledum groenlandicum)*—Found in bogs in northern and eastern part of the State. Suspected as being poisonous.

Larkspur *(Delphinium tricorne)*—Found in extreme southwestern part of State. Not abundant. If found in pasture it should be suspected.

Lily-of-the-Valley *(Convallaria majalis)*—Chickens have been poisoned by eating the decaying flowers. The entire plant, however, is poisonous. The plant is found only in cultivation and few cases of poisoning are on record.

Lupine *(Lupinus perennis)* (Fig. 35)—While this plant is found in Pennsylvania, it is usually not plentiful and so far as known, no cases of poisoning in the State have been reported. Several western lupines have caused much trouble, especially with sheep.

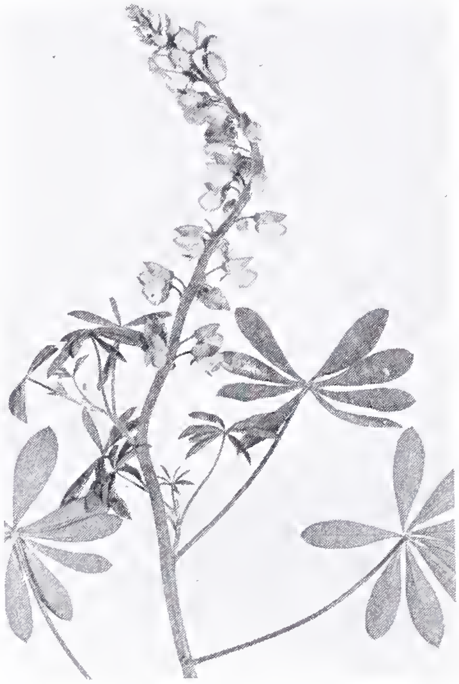

Fig. 35. Lupine

Marsh Marigold *(Caltha palustris)* (Fig. 36)—The leaves and flower buds are sometimes used as a pot herb. It has been reported on quite good authority that cattle have died from eating the plant.

Mexican Tea *(Chenopodium ambrosioides)*—The oil is a vermifuge. In large doses it is a narcotic, acrid poison which acts on the brain, spinal cord and stomach.

Mustards *(Brassica spp.)*—Some of the mustards such as *Brassica nigra, Brassica arvensis,* and other species are no doubt harmless in the young stage, but may cause trouble after flowering, when the seeds have formed. The above species are quite common as weeds in Pennsylvania.

Poppies *(Papaver spp.)*—Several species of poppy have escaped and are found growing as a weed in parts of Pennsylvania. Horses, cattle and pigs have been poisoned by eating *Papaver dubium.*

Potato *(Solanum tuberosum)*—The common white or Irish potato has caused trouble when the skin, greened by being exposed to light, has been eaten. These greened tubers and those with young sprouts have caused poisoning when fed to livestock, usually when fed raw.

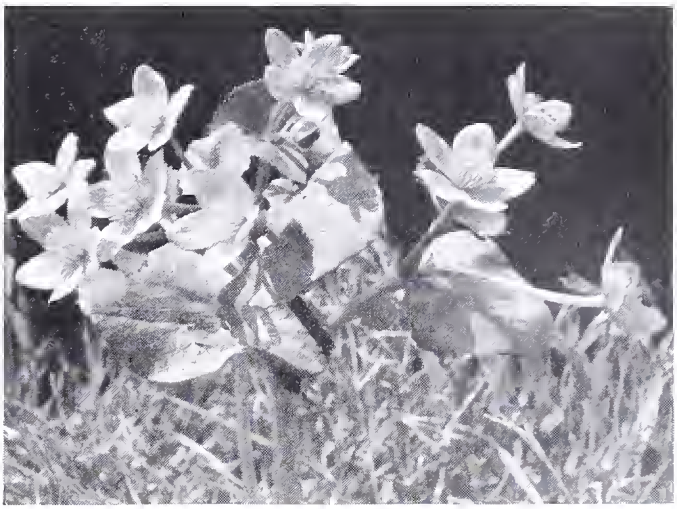

Fig. 36. Marsh Marigold

Privet *(Ligustrum vulgare)*—Much used as a hedge plant. Children have died from eating the berries. Horses have also been poisoned by eating the foliage.

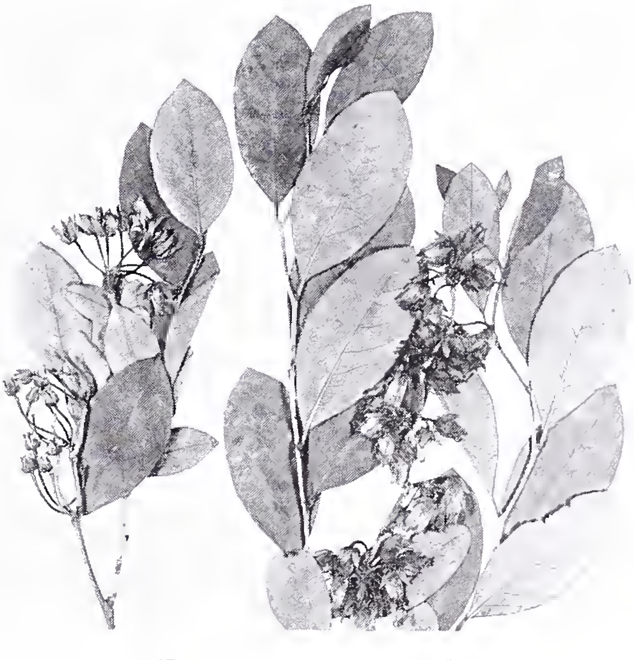

Fig. 37. Stagger Bush

Rattle Box *(Crotalaria sagittalis)* — It causes stupor, labored breathing, weakness, emaciation, perverted appetite, sometimes paralysis and death. It is not abundant in Pennsylvania, but might appear in pasture in sufficient quantity to cause trouble.

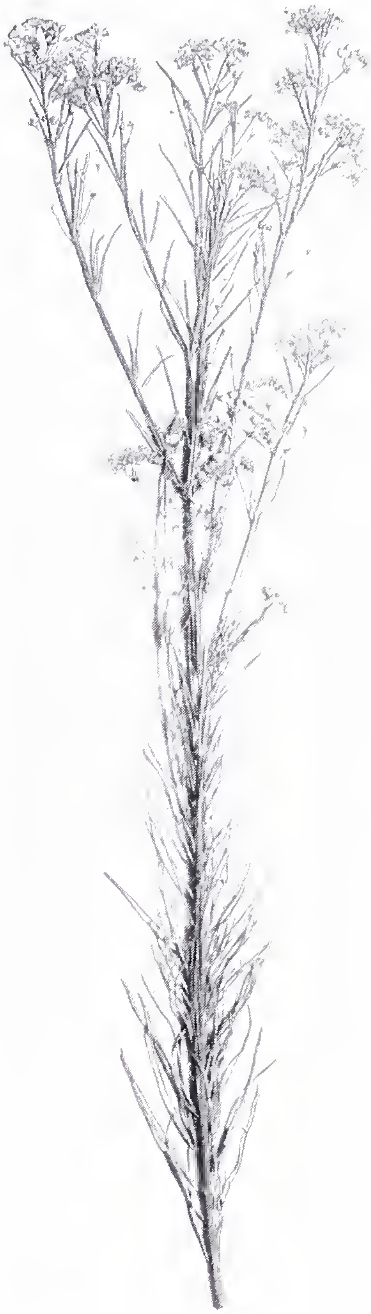

Fig. 38. Whorled Milkweed

Red Cedar *(Juniprus virginianus)*—It is reported that goats have been poisoned by browsing upon it.

Rhododendron *(Rhododendron maximum)*—This shrub is found along the mountain streams. It is not often eaten, therefore, few reports of poisoning are recorded.

Scarlet Pimpernel *(Anagallis arvensis)*—It may not be eaten in sufficient quantity to cause poisoning, nevertheless it is poisonous and should be looked upon with suspicion. The plant is quite common, although usually not abundant in Pennsylvania.

Stagger Bush *(Lyona mariana)* (Fig. 37)—Sheep have been killed by eating the leaves of this plant. It is quite rare in Pennsylvania, being found only in the eastern part near the coast.

St. John'swort *(Hypericum perforatum)*—This plant is very common in Pennsylvania. Perhaps it is not so poisonous as the reports might indicate.

Tobacco *(Nicotiana tabacum)*—The cultivated tobacco plant is seldom eaten. However, livestock have been poisoned by eating leaves which were placed within their reach to dry.

Whorled Milkweed *(Asclepias verticillata)* (Fig. 38)—Whorled milkweed is not common in Pennsylvania, but it has been found in rather large colonies in a number of counties in the State. In the west, this and other closely related species have caused much trouble.

Wild Radish *(Raphanus raphanistrum)*—Similar to the mustards. It is becoming a bad weed in parts of Pennsylvania.

PLANTS WHICH MAY CAUSE MECHANICAL INJURY

Sand Bur *(Cenchrus tribuloides)*—The spiny covering surrounding the seed may cause injury.

Downy Brome Grass *(Bromus tectorum)*—The long beards may cause inflammation by getting under the teeth.

Squirrel-tail Grass *(Hordeum jubatum)*—The long beards may cause injury similar to that of the downy brome grass.

Clover *(Trifolium incarnatum)*—The hairs on crimson clover sometimes form balls (Phytobezoars) in the stomach and intestines of cattle and horses.

PLANTS WHICH POISON THE SKIN

In addition to poison ivy and poison sumac, there are other plants which cause irritation of the skin. Among these are:

Spurges—Snow-on-the-mountain *(Euphorbia marginata)*, Flowering spurge *(Euphorbia corollata)* and other species, all of which contain an acrid milky juice.

Ladyslippers—*(Cypripedium hirsutum)*, *(Cypripedium parviflorum)* and *(Cypripedium pubescens)* cause skin irritation on some persons.

Primrose—Cultivated house plants such as *Primula obconica* and other species cause very severe skin poisoning with some individuals.

St. John'swort—*(Hypericum perforatum)* is thought to cause severe eruptions on cow's udders and on the feet of white-haired animals. The skin of humans is also poisoned by the milky juices.

Nettles—*(Urtica dioica)*, *(Urtica gracilis)*, and *(Laportea canadensis)*. They cause painful nettle rash on the skin.

Other plants which may cause some irritation on certain susceptible persons are: Common hop *(Humulus lupulus)*, wild ginger *(Asarum canadensis)*, mayweed *(Anthemis cotula)*, osage orange *(Maclura pomifera)*, common field buckwheat *(Fagopyrum esculentum)*, buttercups *(Ranunculus spp.)*, clematis or virgin's bower *(Clematis virginiana)*, leather wood *(Dirca palustris)*, the flowers of the tree-of-heaven *(Ailanthus glandulosa)*, catalpa *(Catalpa speciosa,)* papaw *(Asimina triloba)*, cow parsnip *(Heracleum lanatum)*.

SOME HAYFEVER PLANTS

The plants which produce hayfever are too numerous to list. They belong chiefly to five families of plants:

1. Grass Family. Examples—
   Orchard Grass *(Dactylis glomerata)*
   Kentucky Bluegrass *(Poa pratensis)*
2. Goosefoot Family. Example—
   Lamb's Quarters *(Chenopodium album)*
3. Pigweed Family. Example—
   Pigweed *(Amaranthus retroflexus)*
4. Ragweed Family. Example—
   Common Ragweed *(Ambrosia artemsiifolia)*
5. Thistle Family. Example—
   Wormwood *(Artemisia absinthium)*

SOME REFERENCE BOOKS AND PUBLICATIONS

A Manual of Poisonous Plants—by L. H. Pammel. The Torch Press, Cedar Rapids, Iowa (1911). A thousand page standard reference book on poisonous plants.

Principal Poisonous Plants of the United States—by V. K. Chestnut. Bulletin No. 20, 1898, U. S. Department of Agriculture, Washington, D. C.

Stock Poisoning Plants of the Range—by C. D. Marsh. Bulletin No. 1245, 1924, U. S. Department of Agriculture, Washington, D. C.

Some Poisonous Plants of New Jersey—by Jessie G. Fiske, New Jersey Agricultural Experimental Station, New Brunswick, N. J.

Principal Poisonous Plants in Kansas—Agricultural Experimental Station, Manhattan, Kansas.

The Principal Stock-Poisoning Plants of New Mexico—New Mexico College of Agriculture and Mechanic Arts, State College, New Mexico.

Some Poisonous Plants of Idaho—University of Idaho, Moscow, Idaho.

Poisonous Plants of Alabama—Circular 71, 1924, The Alabama Polytechnic Institute, Auburn, Alabama.

Thirty Poisonous Plants of the U. S.—by V. K. Chestnut. Farmers Bulletin No. 86, 1898, U. S. Department of Agriculture, Washington, D. C.

Poisonous Plants of Pennsylvania—by Edward H. Graham, Carnegie Museum, Pittsburgh, Pennsylvania (1935).

Pastoral and Agricultural Botany—by John W. Harshberger. P. Blakiston's Son & Co., 1012 Walnut St., Philadelphia, Pa.—The first 9 chapters of 116 pages are devoted to Poisonous Plants of the United States. The chemistry of Poisonous Plants is fully discussed.

Plants Poisonous to Livestock—by Harold C. Long, Cambridge University Press, Cambridge, London.—Many American plants are fully treated.

Some Poisonous Plants of Western Pennsylvania—by L. K. Darbaker, University of Pittsburgh, Pittsburgh, Pa.—A mimeographed circular listing approximately one hundred poisonous plants of Western Pennsylvania.

Plants Which Cause Hayfever—Published by The Arlington Chemical Company, Yonkers, New York.

Asthma, Hayfever and Related Disorders; A Guide for Patients—by Samuel Feinberg. Published by Lea, Philadelphia, Pa. (1933).

Hayfever and Asthma—by R. M. Balyeat. Published by Davis, 1911-16 Cherry St., Philadelphia, Pa. (Latest Edition).